THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

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GAS PURIFICATION
BY
OXIDE OF IRON.

COOKE BROS.,
CENTRAL DEPÔTS:
CO. DONEGAL, IRELAND;
LONDON DEPÔT:
BLACKWALL, E.;
OFFICES:
26, 27, & 28, FENCHURCH ST.,
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GENUINE TORBAY PAINT
And SPECIAL GASOMETER PAINT.
Several Prize Medals. Established over 20 Years.
These Paints are now used in over 200 Country Gas-Works, and by all the London Gas Companies, on Gas-holders, Scrubbers, Purifiers, &c. Also used by the Admiralty, War Office, Railway Companies, Founders, &c. They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations; do not crack, blister, or flake off; will cover tar effectually.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
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BROOKFIELD GAS APPARATUS WORKS,
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CONTRACTOR FOR
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Gas, Water, & Sanitary Purposes,
AND MANUFACTURER OF
WOOD GRIDS
FOR
SCRUBBERS AND PURIFIERS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
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J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL & CO.,
LIMITED,
Established at the commencement of Gas Lighting,
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THREE PRIZE MEDALS,
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BELL BARN ROAD, BIRMINGHAM,
Manufacturers of
WET AND DRY GAS-METERS,
Licensees and Manufacturers of
HUNTS
PATENT COMPENSATING METERS,
STREET-LAMPS, &c., &c.
Established 1830.

THOMAS PIGGOTT & CO.,
SPRING HILL, BIRMINGHAM,
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TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.
London Offices: 97, CANNON STREET—
JAMES E. & SAMUEL SPENCER, Agents.

THE
"OTTO" GAS-ENGINE.
See Page 426.
CROSSLEY BROTHERS,
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THE
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DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.
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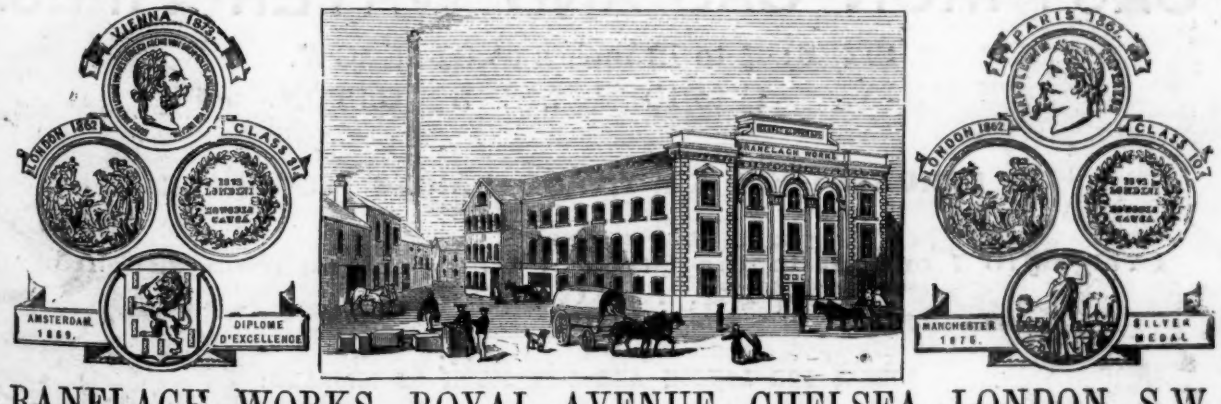
DRY GAS-METER MANUFACTURERS,
HAVE REMOVED TO MORE EXTENSIVE PREMISES:



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Manufacturers of W. J. WARNER'S PATENT MARKET GAS STAND-PIPE.

Now ready, GAS CHANDELIER BOOK (Reduced Prices), 7s. 6d.

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GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,

ROSE MOUNT IRON-WORKS, ELLAND, YORKSHIRE.

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS;

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Plans and Specifications Prepared, and Illustrated Catalogues forwarded on application.

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IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

And all kinds of Experimental Gas Apparatus.

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SIZES: ¾ to 12 inches at GLASGOW.

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A LARGE STOCK KEPT, AND PRICES MODERATE.

Freight to London, in the Stream, 10s. per ton from Stockton: 15s. from Glasgow.

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ALSO PATENT DRY COPPERAS FOR EXTRACTING AMMONIA.

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IMPROVED HYDRAULIC CRANES,

Effecting a great saving in the cost of discharging Coals from Vessels, Barges, &c. Several of these Cranes, with the necessary power, are now being erected at the Beckton Gas-Works.

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HYDRAULIC APPARATUS for Lifting and Lowering Purifier-Covers.

Sixteen recently erected at Beckton, applied to Covers 30 feet square.

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SULPHATE OF AMMONIA APPARATUS,

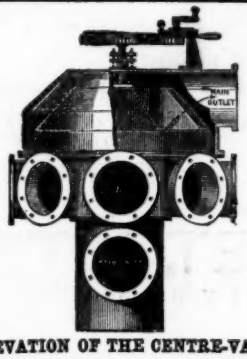
IN SUCCESSFUL OPERATION AT THE NEW WORKS OF THE NEWCASTLE AND GATESHEAD GAS COMPANY.

For particulars, apply to

JOHN ABBOT & CO., LIMITED,

2, SUFFOLK LANE, CANNON STREET, E.C., or PARK WORKS, GATESHEAD-ON-TYNE.

C. & W. WALKERS'
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.

PLAN OF THE VALVE.

PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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WILLEY & COMPANY,

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WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

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An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

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GAS PURIFICATION & CHEMICAL Co., LIMITED,

PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.

JOHN WM. O'NEILL, Managing Director.

MESSRS. NEWTON, CHAMBERS, & CO.,

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MANUFACTURERS OF

IMPROVED CENTRE-VALVES,

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

WEST'S GAS IMPROVEMENT COMPANY,

LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

EDWARD COCKEY & SONS,

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MANUFACTURERS OF ALL DESCRIPTIONS OF

APPARATUS CONNECTED WITH GAS-WORKS.

THE ORIGINAL PATENTEES AND MANUFACTURERS OF THE

DRY-FACED VALVES

FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

MANUFACTURERS ALSO OF SUPERIOR WOOD GRIDS FOR PURIFIERS, SCRUBBERS, &c.

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And every Description of Gas Apparatus.

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MANUFACTURERS OF

WET & DRY CONSUMERS GAS-METERS,

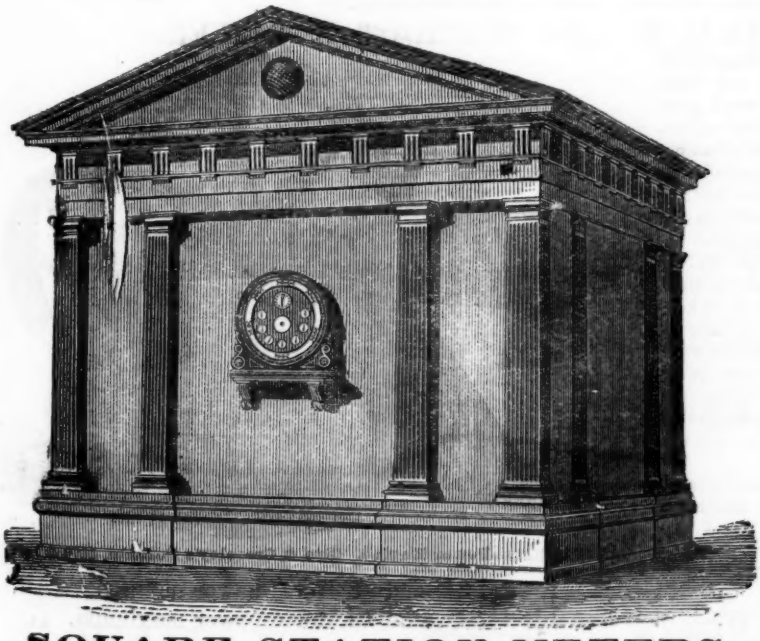
OF THE HIGHEST EXCELLENCE ONLY;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

GAS COOKING APPARATUS.

Home and Foreign Orders promptly attended to.

Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

TERMS, &c. ON APPLICATION.

C. & W. WALKER'S

WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

MIDLAND IRON-WORKS,
DONNINGTON, NEAR NEWPORT, SHROPSHIRE.
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ESTABLISHED IN 1860.

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THE ORIGINAL MANUFACTURER OF THE IMPROVED

WOOD SIEVES

FOR

GAS PURIFIERS & SCRUBBERS.

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FIRE CLAY and BRICK WORKS,

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Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAY.
Manufacturers for Home and Export.
GAS-RETORTS, GLASS-HOUSE FURNACE,
BLAST-FURNACE, TANK BRICKS, LUMPS, TILES,
And Every Description of Best Fire-Bricks.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

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CANNEL COAL FACTOR,

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Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

GRIRDROD'S PATENT

PORTABLE PIPE SCREWING MACHINE,

For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great satisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,

Brassfounders, Gauge Injector and Tool Makers,

ALBION WORKS, SALFORD,

LANCASHIRE.

Gold Medal Awarded, Paris Exhibition, 1878.

THOMAS TURTON AND SONS,

SHEAF AND SPRING WORKS,

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MANUFACTURERS OF

FILES OF BEST QUALITY FOR ENGINEERS,

STEEL OF ALL DESCRIPTIONS,

SCREW STOCKS, TAPS, AND DIES, SPANNERS
RATCHET BRACES, LIFTING-JACKS,
ANVILS, VICES,
AND ENGINEERS TOOLS GENERALLY.

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R. W. WINFIELD AND CO.,

CAMBRIDGE STREET WORKS AND ROLLING MILLS,

BIRMINGHAM.

The following Medals have been awarded:—

GRAND COUNCIL MEDAL, LONDON, 1851. MEDAL, LONDON, 1862. GOLD MEDAL, PARIS, 1867,

The only Gold Medal awarded for "Apparatus and Processes for Heating and Lighting" by the Imperial Commissioners.

MEDAL FOR PROGRESS, VIENNA, 1873.

The following Medals were also awarded at Paris, 1878:—

GOLD MEDAL for Chandeliers and Gas-Fittings.

GOLD MEDAL (Rappel) for Metallic Bedsteads and Furniture.

GOLD MEDAL (Rappel) for Art Metal Work. BRONZE MEDAL for Tube Metal and Wire.

MANUFACTURERS OF BRASS AND COPPER SHEETS,

TUBE AND WIRE,

ROLLED METALS, LOCOMOTIVE AND CONDENSER TUBES, CYLINDERS;

Ornamental, Taper, and Cased Tubes; Tin Tubes;

GAS-FITTINGS, CHANDELIERS,

BRACKETS FOR HEATING AND LIGHTING;

METALLIC BEDSTEADS.

Ecclesiastical and Mediæval Metal Workers.

GENERAL BRASSFOUNDERS.

REGISTERED TRADE MARK:

LONDON OFFICES & SHOW-ROOMS: R. W. W. & CO. 141, FLEET STREET, E.C.

THE

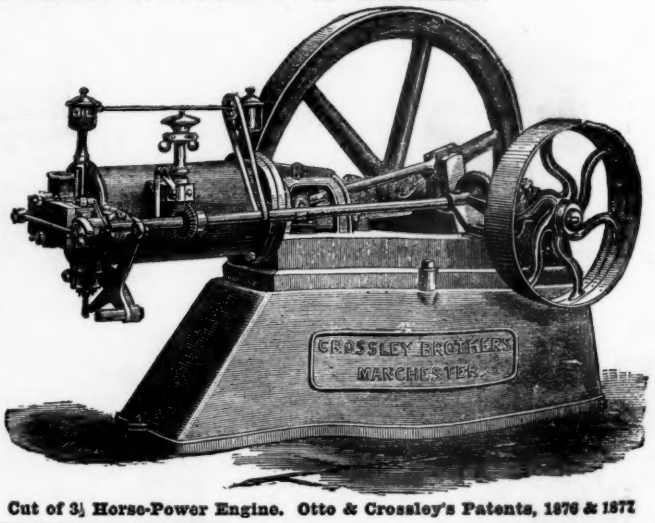
New "OTTO" Silent Gas-Engine.

AN ENGINE WHICH WORKS WITHOUT A BOILER.

The principle of combustion in this Gas-Engine is ENTIRELY NEW. In it an explosion does not take place in the ordinary meaning of the term. A small part only of the charge is combustible, which on ignition serves to expand the remainder, thus avoiding shock and effecting great economy. The Engine is also alone in the peculiarity of igniting its charge at the *beginning* of the stroke, leaving the whole of the stroke for effecting expansion of the gases, instead of merely a fraction as in obsolete constructions.

This Engine has a SMALLER NUMBER of MOVING PARTS than any other Gas-Engine; or, indeed, than many steam-engines. It is almost as silent as a steam-engine, works with the same smoothness and regularity of speed, and has the immense additional advantages of always being ready to start at full power at once on the gas being lighted; and, by dispensing with the boiler, of avoiding the danger of explosion, increased rates for insurance, expensive attendance, and all the annoyance which the use of a boiler entails.

Where work is intermittent, trouble with a small steam-engine and boiler is at its maximum, but at its minimum with a Gas-Engine.



Cut of 3½ Horse-Power Engine. Otto & Crossley's Patents, 1876 & 1877

Sizes at present offered . . . . . 1, 2, 3½, and 8 Horse-power nominal.
Being equal to about . . . . . 1½, 2½, 4, and 12 Horse-power maximum.

Cost of Gas, One Penny per hour per indicated Horse-power, at 4s. per 1000 cubic feet.

PRICES, LIST OF USERS, AND BOOK OF SEVENTY TESTIMONIALS, ETC., ON APPLICATION TO

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WORKS: GREAT MARLBOROUGH STREET, MANCHESTER.

LONDON WAREHOUSE: 116, QUEEN VICTORIA STREET, E.C.

SOLE ENGLISH AND COLONIAL MAKERS.

TANGYE BROTHERS AND HOLMAN,

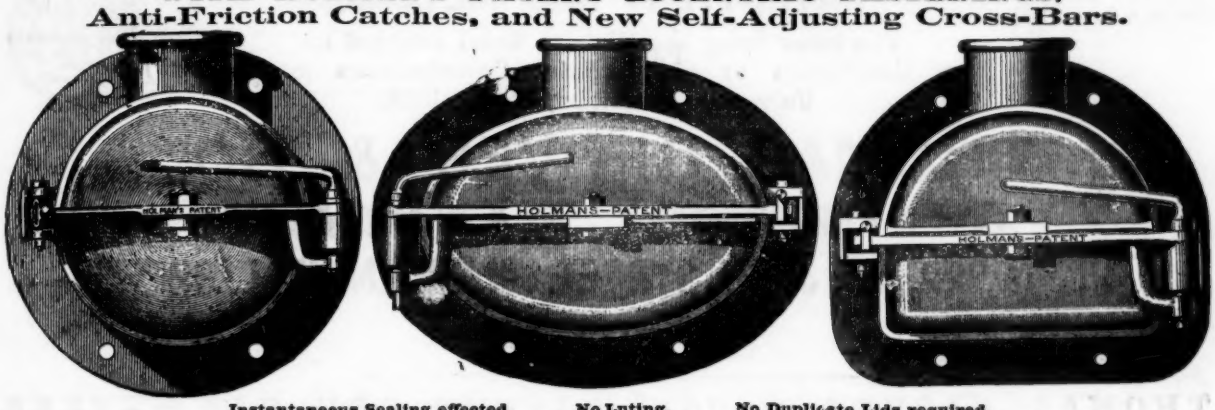
CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

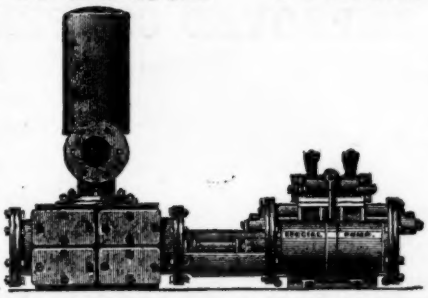
Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	20
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



In use in a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

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Two Hundred Sizes made. Those in Table opposite are the leading Sizes for use in Gas-Works and Chemical Works.

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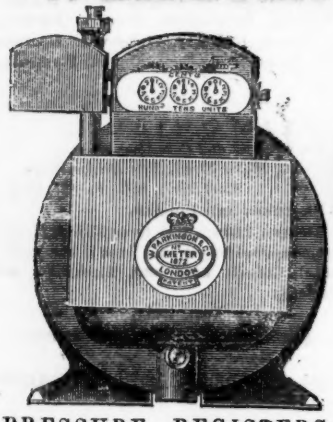

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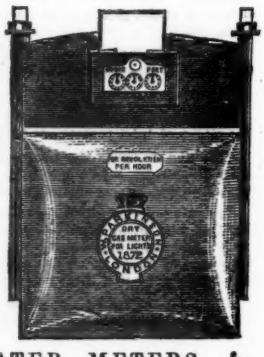

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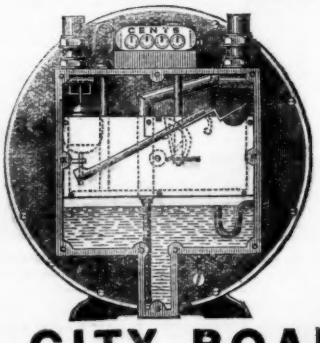

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 25, 1879.

Circular to Gas Companies.

We notice with some surprise that, on the motion of Mr. Raikes, the order (11th of March) for the committal of the Liverpool Lighting Bill to a Select Committee, was last night read and discharged. Perhaps, after all, the result is not so astonishing, for, as we have urged, the electric light is at the present moment not in a position to be legislated upon. We scarcely know anything about it beyond this—that, given a steam-engine or a gas-engine, and a dynamo-electric machine, a bundle of wires, and some carbon points, a light of great intensity can be produced. We know also that a single dynamo-electric machine is capable of supplying about six lights. There, for the present, we believe, our knowledge ends; and not only our knowledge, but our practice also. What is there to legislate upon? When the time comes which certain far-seeing parties in Liverpool have talked about, and a central establishment is set up in the middle of their borough, to send the electric currents to the borders, then it will be time enough for Parliament to settle definite rules. For the present, there is nothing to be said except this, that the electric light requires development. Advances will, no doubt, be made; but, unless we are greatly mistaken, it will be very many years before the light is in a position to claim the protection or invite the restriction of a general Act of Parliament. Mr. Raikes has, for once, been carried away by over-zeal. Doubtless he is extremely anxious to protect the public interests in every possible way; but, for the present, no protection is wanted against the electric light, which may be allowed—we will not say to die, but to become extinct for another quarter of a century.

A report from the Parliamentary Committee, presented at the last meeting of the Metropolitan Board of Works, having reference to the Chartered Company's Bill, recommended the Board to consent to allowing a discretionary power to the magistrate in settling the forfeitures to be incurred by the Company for defective illuminating power, or excess of impurity. We have repeatedly said that, so far as regards the Chartered Company, it is impossible to trace the origin of the gas, and thus the system which apportioned the forfeiture according to the make was both unjust and absurd. The Metropolitan Board, now that the fact is recognized which we have long insisted upon, have consented that, for the future, "for defective lighting power, the "forfeiture shall be not less than £25, and not more "than £100, for each candle by which the power is defi-"cient, without reference to the works at which the gas "is made." These are terms to which we do not expect the Chartered Company will object. The discretionary power of the magistrate, within certain limits, is strictly defined, and since a deficiency of a whole candle power is a thing rarely met with, we do not think the Chartered Company will lose much by forfeitures. As regards impurity, the clause of the Company's Act will stand as it is; the magistrate's discretionary powers being allowed, as provided for in the Bill now before Parliament. This action of the Metropolitan Board of Works shows wisdom. The Chartered Company were certain to succeed with their Bill, but the concession of the Board comes with no less grace. Very few, if any, squabbles will, we think, arise, unless the over-zeal of the Examiners appointed by the Vestries leads them to make the worst possible of the gas. These gentlemen, however, having no legal status, may report what they like.

We have received the report and the accounts of the Directors of the London Gaslight Company for the half year ending Dec. 31, 1878. The balance of profit applicable to dividend is £26,481, which, after paying the dividend, leaves an unappropriated balance of £7066. It is highly gratifying to find in this, as in every other case, in which a well-managed gas undertaking exists in an improving neighbourhood, that the consumption of gas steadily increases. Although, as our readers know, a reduction of price was made last year, the revenue of the Company has not fallen off; the income for the past half year showing, indeed, an increase of £3166 over the corresponding period of the previous year. We are happy to say that a better price has been obtained for residuals. It is true that the price of some are dependent upon influences liable to disturbance; but coke, the staple residual, should vary but little in price. It is very satisfactory to know that, in the middle of last year, the Directors gave instructions to the Engineer to further improve the quality of the gas. The Act of 1860, under which the Company are still working, only requires them to supply twelve-candle gas, tested by a burner now obsolete, which, probably, destroyed half the light the gas would have afforded. It is commonly reported that the illuminating power of the gas now supplied by the Company is somewhere about sixteen candles, which makes it nearly equal in value to that supplied by the other Metropolitan Companies. The Directors refer in their report to their Bill which is now before Parliament. It only asks for reasonable powers—namely, to manufacture, purchase, or let for hire, fittings, engines, stoves, pipes, and other appliances for lighting, heating, cooking, and other purposes. The Company further ask for powers of inspection, which we have recently said all Gas Companies should possess. The Bill, we believe, will pass almost unchallenged It will be seen that the Company do not desire to have any special privileges with respect to the electric light, which they quietly allow to drop out of consideration.

One thing somewhat surprises us, and that is the absence from this report of any reference to amalgamation. Unless we have been misinformed, prolonged negotiations have been in progress, the object of which was to effect amalgamation between the Southern and the Northern Companies. The London Company stands in an entirely exceptional position. Like a Colossus, it bestrides the river, and pushes its mains into the heart of central London, where one could hardly in these days expect to find them. Of the other Southern Companies we shall probably learn more when their reports are published, and the meetings have been held. We sincerely hope that nothing stands in the way of a combination, which must prove advantageous to both Companies and Consumers. The Metropolitan Board of Works are not at all likely to object to a scheme which brings Companies now under the Metropolis Gas Act, 1860, under the provisions of The Gaslight and Coke Company's Act, 1876. Whatever the Board may think of forfeitures, they must admit that the provisions of the Act we have named are admirably adapted to benefit consumers. The one thing wanted is what the London Company now propose to add, and that is, power to protect the

consumer against himself, or rather against bad advisers. The loss which will accrue to the Company, in consequence of a careful examination of fittings, we shall not attempt to appraise. All we hope is that increased consumption for cooking and heating purposes will make up for the deficit which will be caused by suppression of leakage and the proper consumption of gas.

The private parliamentary gas business will be shortened this session by an arrangement which has been come to between the Corporations of South Shields and Jarrow and the South Shields Gas Company. It has been settled that the standard price to be charged by the Company, subject to the sliding scale, shall be 3s. 3d. per thousand, with discounts, which need not here be detailed. But the sliding scale is not to come into operation until an initial price of 3s. per thousand is reached. We shall not here express any opinion as to the effect of this provision of the South Shields, and the similar provisions of the Newcastle and Gateshead Company. We regard the settlement as eminently unsatisfactory to both Companies; but if the Local Authorities and the Companies are content, so are we.

In another column will be found a report of the half-yearly meeting of the Dover Gas Company, which was held early in the present month. The Company pay full dividends for the half year ending Dec. 31, 1878, and carry forward a balance of £337. Dover continues to increase in population, and necessarily in area; and the Gas Company have been rather severely taxed during the past winter to keep up a full and satisfactory supply. The works evidently require considerable extension, and we are glad to see that the Directors have decided on adding, at all events, to the storeage capacity.

The Leicester Town Council have had before them the report of the Gas Committee on the working of their undertaking during the past half year, during which it seems a net profit of £11,143 has been made. This sum the Committee propose to allocate as follows:—£5000 to a reserve-fund, £2466 in reduction of the district-rate, and £1002 to the sinking-fund for the redemption of the debt. As a matter of course, when a gas undertaking is so prosperous, the consumers look for a reduction of price. Considering the special circumstances of the Leicester undertaking, we cannot help thinking that the Council are justified in refraining from making the reduction requested. Complaints of the quality of the gas may, of course, be expected. They were common when the works were carried on by the Gas Company (who supplied an excellent article), and were, to a certain extent, fostered by the Corporation. Now the latter are exposed to the same unjustifiable accusations. The Leicester Gas Act gives the Town Council no power to interfere with the internal fittings, but, as a matter of principle, they should unite with all Companies and Corporations in urging upon the Legislature the advisability of granting powers to save consumers from the consequences of ignorance and stupidity.

The Gas Committee of the Corporation of Middlesbrough some time ago resolved to enlarge their storeage capacity. Somebody—we do not know who—selected a plot of marshy ground in which to make a tank and erect a gasholder. The Gas Manager, who had not, so far as we know, been consulted up to this time, was requested by the Committee to superintend the building of the tank. His reply was that he had had no experience in the construction of tanks, and would rather not assume the responsibility. The Committee met him so far as to agree to the appointment of a Clerk of the Works, who should relieve the Manager, if not of the responsibility, at all events of the work of superintending the construction. It was here, unfortunately, that mishaps began. The Clerk of the Works presented accounts to the Gas Manager, for the Contractor's work done, and they were duly signed; but, by an oversight which we cannot excuse, the Manager signed for a much larger sum than the Contractor had earned. We say "earned," and, no doubt, in one sense, it was earned; but, as a matter of fact, the walls of the tank tumbled in, and, if we are not misinformed, the ruins remain to this day. The responsibility of the mishap rests mainly with those who chose an unsuitable site for the tank. Some blame, no doubt, appertains to an officer who, knowing his ignorance, allowed himself to be forced into the performance of a duty he was not competent to discharge. Saying nothing about the Contractor, we may remark that the Gas Committee of the Corporation of Middlesbrough were grossly neglectful of their duty when they, in a measure, compelled their Manager to undertake work for which he told them he was unfit. All the rest follows as a matter of course, and now the shot has to be paid. The Gas Manager has certified for the payment of £2530 beyond the value of the work which the Contractor was supposed to have executed. At the last meeting but one of the Town Council, the unfortunate Manager offered to repay the Council the excess for which he had certified. His offer, however, was not accepted, and his resignation is now insisted upon by the Gas Committee, whose minutes will, we fear, be confirmed by the Council. There appear to be three cardinal errors in this business. The first concerns, so far as we know, the Gas Committee, who selected an altogether unsuitable site for a gasholder-tank; the next no less concerns the Gas Committee, who insisted that a Manager, who had announced his incompetence, should superintend the construction of the tank; lastly, the selection of the Contractor, we may take it, the Gas Committee were entirely responsible. To put the thing bluntly and plainly, we consider them to blame for the whole lamentable business. They may, if they choose, compel the resignation of Mr. Booth, whom we do not defend on all points; but it will not help them in the least to get back their lost money, or retrieve their reputation as designers of gas-works.

We are happy that a good understanding has been arrived at between the Local Board of Standish and the Wigan Corporation. We do not often interfere with the squabbles of Local Authorities, even when gas matters are concerned; but, in this case, a somewhat important question was raised, and Local Boards will stand on their dignity. The merits of the case, we must candidly say, we do not fully appreciate; but it must be admitted that the Standish Local Board have the best of the argument. They insist that notice shall be given when the Corporation of Wigan intend to break up the highways in the Standish district, but, at the same time, good-naturedly agree that the Gas Manager of the Wigan Corporation (Mr. Hawkins) and the Surveyor of the Local Board may quietly settle matters between them. We wish that all Local Authorities would arrange differences with Gas Companies in this easy manner.

A silly outcry has been raised at Leeds against the projected exhibition of gas appliances in the Victoria Hall. Our readers have been informed that a precisely similar exhibition was held at the Town Hall, Birmingham, from which no bad effects resulted. The dingy Town Hall, as we described it at the time, was as bright after the exhibition as it was before. The Victoria Hall at Leeds differs, in some respects, from the Birmingham Town Hall—it is lighter and brighter; but we are perfectly certain that the accumulated evolution of vapours arising from the consumption of gas will not in the least affect the gilding, upon which the Corporation have recently expended £2000. As a matter of fact, the products of the combustion of gas, which do undoubtedly exercise a pernicious effect on some objects of ornamentation, are not apparent on gilding; and the residents of Leeds may, therefore, rest assured that no injury will result to their beautiful hall from the holding in it of the proposed exhibition, which, unless we are much mistaken, will prove a great success.

Mr. Wigham's new gas-lamps are being introduced into their birthplace, Dublin, with much success, which it is expected will be increased by a more liberal exhibition. The Dublin Corporation are, unfortunately, impecunious, so that we cannot expect from them any great improvement in gas lighting. If Mr. Wigham will furnish the lamps, and the Alliance Company will supply the gas gratis, in several prominent positions which have been pointed out to them, the appearance of Dublin will be greatly improved; but perhaps, after all, early closing and comparative darkness is best suited to the city.

Water and Sanitary Notes.

Sir U. Kay-Shuttleworth has taken up the question apparently dropped by Dr. Lyon Playfair, as to the death-rate in the Metropolis, and the condition of the water supply. His question brought out no facts which would indicate that the health of London has been undergoing any deterioration. Any one who will consult the records of the Registrar-General's Office from the time the Registration Act came into operation, will see that little variations in the death-rate have taken place, except under the influence of epidemics. It may be said to have been constant, between twenty-two and twenty-three per thousand. Much was expected from the effectual sewerage of the Metropolis. Before 1856, any excess of deaths was attributed to deficient drainage arrangements. Now, some other excuse must be found, and the water supply is fixed upon. It is clear, from Mr. Sclater-Booth's statement, that, as a matter of fact, the water furnished to the Metropolitan public has been improved in quality during the last decade. Difficulties will arise, and excessive floods will interfere with perfect filtration. But, after all, what has this to do with the spread of disease, of which, however, there is no evidence? As regards zymotic diseases, that these are on the decrease, is shown by the fact that the average death-rate from them has declined in the course of the last ten years. The average is now only four per thousand, and the

greater number is made up by whooping-cough, which comes of nobody knows what, and infantile diarrhœa, which is usually brought on by improper feeding, not to mention parental excesses. Sir U. Kay-Shuttleworth's question fell flat on the House, and his figures produced no alarm in the minds of members, whose public duties require them to reside for several months in the pestilential air of the Metropolis, and who are compelled, if they drink water at all, to imbibe that taken from the Thames. We have before remarked that no connection has ever been established between the spread of disease and the quality of the Metropolitan Water Supply. We are not here unmindful of the case of the East London Water Company and the last cholera outbreak. Those who attempted to fix the responsibility of that outbreak on the Water Company, are now probably ashamed of their proceedings. To assert that whooping-cough comes of drinking slightly turbid water is beyond the audacity of any sanitary officer.

We report in another column a case of considerable importance to Water Companies. The question in dispute in the case of *Wilkinson v. The Sheffield Water-Works Company* relates to the liability of a Water Company to restore a supply to a house under the annual value of £10, after it has been cut off for non-payment of rates. The Stipendiary Magistrate for Sheffield held that, when the arrears of rates were tendered, the Company were bound to renew the supply without payment of the cost of restoring the connections, and fined the Company in full penalties. Against this decision an appeal was made, which resulted in the reversal of the Magistrate's decision; but, as the case will be carried to a higher Court, we do not know how far we are justified in commenting on the proceedings in the present stage. We have not, at this moment, the special Act of the Sheffield Water Company before us, but we feel assured that its provisions are in accordance with the General Act of 1847, under which enactment these proceedings were, indeed, taken. This Act is perfectly explicit as to the right of a Water Company to make an incoming tenant, successor to a defaulter, liable for the charges of restoring the connection of the premises with the water-main. It is not sufficient that the amount of the unpaid rate be tendered. Lord Justice Bramwell thinks it clear that, in the case of a house under the value of £10, the duty of making a connection rests with the Company, who can, of course, make a charge for the work; while, in the case of premises of more than £10 annual value, the owner or occupier may connect with the main at his own expense. We leave the matter here for the court of law to decide, for it seems that a Sheffield Consumers Association will take the case to the highest tribunal.

The Town Council of Leicester have published the accounts of their water undertaking for the past half year. These are quite satisfactory, the net profit realized being ample. We are glad to see that there is no intention of handing any part of this profit over to the district-fund. It is divided into nearly equal proportions between the sinking-fund, which the Council have wisely resolved to commence at once, and a reserve-fund, now first instituted. The works are adequate for the supply of Leicester for a good many years to come, so the Corporation have a prosperous time before them, if they will only restrain their consumers from wasting water.

We are all aware that the rateable value of Metropolitan property has enormously increased; but the exact extent of the increase is not generally known. Mr. Watherston has been at the pains to set out the figures in a letter to *The Times*, the object of which is to insinuate that the Water Companies are charging higher rates than would be justified by the increased valuation. Nobody knows better than the writer of this letter, that the Water Companies do nothing of the kind. There is not a single case to be adduced in which a Company have availed themselves of their power to charge for water according to the increased assessable value of the property supplied. It is very little to the purpose to show, as Mr. Watherston does, the increased value of property in certain parishes. Everybody knows, for example, that property in Kensington has lately become much more valuable. It is now assessed at 424·3 per cent. more than it was in 1856; but the increase of the income of the Water Companies has not risen in anything like a similar ratio. Every new house has, of course, brought an additional customer; but the rates he is subjected to do not, we may take it, vary greatly from those levied twenty years ago. In what might be called the non-improving localities, such as Christchurch, Spitalfields, and St. John's, Westminster, in which the increase has been but little over 104 per cent., we may fairly suppose the Water Companies have made no change in their rates. The largest increase in annual value has taken place in the Charterhouse, the grounds of which, formerly of little rateable value, are now covered, mainly with warehouses and workshops.

THE RIVERS CONSERVANCY BILL.

The rating clauses in the Rivers Conservancy Bill fail to commend themselves to the approval of the Earl of Redesdale. His lordship considers that the Bill is designed to tax the upper districts of a river basin, for the benefit of the lower. This view of the case he has embodied in a resolution, which his lordship intends to bring forward on Thursday, April 3, on the motion for the House to go into Committee on the Bill. The resolution runs thus:—"That if A, having ten years ago purchased a property in the uplands of a River Conservancy district, in the valuation of which the liability to a charge for a conservancy rate could not have been included; and B, having in the same year purchased a property in the floodlands of the same district, in the valuation of which the damage from floods must have been necessarily estimated, it will be unreasonable and unjust that A's property should be taxed for the improvement of B's property, when his lands cannot receive any benefit from the outlay to which, under the Rivers Conservancy Bill, he is to be compelled to contribute." Such is the resolution with which the Earl of Redesdale seeks to strike a blow at the system of rating proposed by the Bill. That system recognizes a certain amount of evil inflicted on the lowlands for the benefit of the uplands, and, therefore, proposes that the upper districts should contribute towards the expense of those measures which are requisite for the protection of the lower. Lord Redesdale is quick to perceive that the lowlands will benefit by the prevention of floods, but he is less observant of the fact that the floods, in the first instance, inflict serious damage in such districts. The so-called "improvement" is really prevention of damage, and this damage itself arises from measures which benefit the uplands. The higher districts have been improving themselves at the expense of the lower, but Lord Redesdale deems it unreasonable and unjust that the lower should be improved at the expense of the upper, even though the greater part of the burden is to be borne by the lower districts, and a small part only by the upper. Thus the Bill provides that the uplands shall not pay more than one-fourth the sum levied on the floodlands. The comparatively small contribution demanded from the upland proprietors is more than Lord Redesdale is ready to concede, and he would have the lowlands bear all the cost of controlling the rivers, while the owners and occupiers in the upland regions go on with the drainage of their land, and discharge the waters in frequent floods on the lands which lie below. The Duke of Manchester has expressed similar views, and both the Duke and the Earl are apparently content that things should remain as they are, rather than they should be called to bear any part of that burden which is falling so heavily on their neighbours.

It is to be observed that the state of affairs which has given rise to the Rivers Conservancy Bill is one of recent date. The Select Committee of the House of Lords, in reporting on the subject of Conservancy Boards, said it was evident, from the information which had been laid before them, that considerable damage had been caused in various parts of England by the prevalence of floods during the winter of 1876-77, and also that such floods had been more frequent and of longer duration in recent times than formerly. This increasing prevalence of floods affects the ten-year period specified by Lord Redesdale. The supposititious B., who purchased a property in the floodlands of a River Conservancy district ten years ago, is now destined to find the floods more frequent and severe than he had a right to expect. The recent excess of water is so much to his detriment, as causing an amount of damage beyond that which was estimated at the time he bought the land. The report laid before the Lords says: "Among the causes which have been assigned for this state of things, the Committee find that prominence is given to the very general adoption of the system of subsoil drainage, owing to which a greatly augmented quantity of water is rapidly carried into rivers, and to the deterioration which is continually taking place in the channels of the rivers themselves, whereby they are rendered inadequate to carry off the drainage of their respective watersheds." It will thus be seen that the Committee give the first place to the subsoil drainage, as causing floods in the lowlands, and it is distinctly specified that such floods are worse now than formerly. Hence the lowlands are undergoing deterioration, while the uplands are enjoying the benefit of more effectual drainage. The Duke of Manchester, when speaking in the House of Lords on the second reading of the Bill, advanced a peculiar theory in hydraulics, by saying: "Underground drainage, by keeping the land dry, and thus in a condition to absorb water in moderation, tended to prevent, rather than to increase floods." We should like to know, in the first place, how the Duke hopes to succeed in "keeping the land dry," except by getting rid of the water. Subsoil

drainage is the same as creating a number of small subterranean watercourses, affording free exit for the water, which otherwise would have to percolate slowly through a mass of minute pores. In opposition to the curious theory advanced by the Duke of Manchester, it was stated by the Earl Cowper that, with the exception of one gentleman, all the witnesses examined before the Committee in 1877 gave evidence that land drainage caused a great increase in the floods: "It "made the rise of the water much quicker than before." This means that the water travels more quickly from the uplands, and, if so, it must be made to travel more quickly along the lowlands, or the latter will suffer by a proportionate increase in the floods. The question then arises, whether the lowlands are to be at the sole cost of making a way for the upland waters. We think not, and the Lords Committee held the same view of the case. If, indeed, the floods were now as they always had been, the A and B argument of the Earl of Redesdale might hold good. It is because affairs are not *in statu quo* that an agitation has arisen on the subject, and the valley of the Thames itself is no exception to the rule, although the Thames and Lea Conservancies are not to be affected by the proposed Act.

There is an appearance of weakness in the Bill in one respect, which was adverted to by the Marquis of Ripon. It is not clear that the Bill will generally provide for that which we were led to expect—namely, one sole authority for one river. If we are still to have divers authorities for a river as it travels on its course, it matters little who those authorities may be. Unity of administration is wanted, and if a river is to be chopped up into sections between conservancy boards old and new, there will be no real remedy for the present disjointed and unsatisfactory state of things. The "saving" clause in the Bill provides that "Nothing in this Act shall authorize any Conservancy Board to "interfere with any watercourse under the control of any other "Conservancy Authority." This appears to contemplate the existence of more than one body of conservators in one watershed. The term "Conservancy Authority" is defined to mean "any "commissioners of sewers appointed by the Crown, and any conser- "vators, commissioners, trustees, or other persons having autho- "rity, by virtue of any Act of Parliament, to protect or control "the navigation or use of any watercourse." There is some way of escape from the dilemma, as set forth in the latter part of the "saving" clause, where it provides that "nothing "in this section shall affect the right of any Conservancy Board to "apply for any Provisional Order authorized by this Act, or "after any such Order has been confirmed by Parliament, to exer- "cise any rights or powers expressly conferred on the Board by the "Order." The 38th clause also specifies that the Local Government Board, in preparing the Provisional Order, may provide "for the repeal or alteration of any local Act relating to the same "subject matter as this Act, and in force within the conservancy "district to which the Order relates, and not conferring powers "or privileges on any person for his own pecuniary benefit." Despite these provisions, we are not surprised that the Marquis of Ripon should say "he did not clearly understand how his noble "friend proposed to deal with existing Conservancy Authorities." The point is not so clear as could be wished, and we fear lest, after all, when the Bill is passed into law, it should be found to perpetuate the old evils, only under a new name and in a somewhat modified form. At the outset the Bill specifies that a Conservancy Board may be established in respect to the whole "or "any part" of the basin of a river. This may be a necessary way of empowering the parties concerned, but the whole tenor of the Bill seems to be of such a nature as to offer an insufficient guarantee for that great measure of reform which is so much required, and which we were led to hope for—namely, the placing of a river under one authority, from its source to its outfall. Thus we read in the report: "The Committee find "that almost all the witnesses examined by them are of opinion "that, in order to secure uniformity and completeness of action "in dealing with each river, each catchment area should, as a "general rule, be placed under a single body of Conservators, who "should be responsible for maintaining the river, from its source "to its outfall, in an efficient state." "In this view," the report says, "the Committee entirely concur."

The Marquis of Ripon, as a member of the Committee, has seemingly some reason to fear that the leading principle to which we have thus referred, is in danger of being sacrificed. "The "Committee are of opinion," says the report, "that means "should be taken to ensure the appointment of a Conservancy "Board for each watershed area." It is not likely that the rivers will be much improved unless this is done. "The incon- "venience of the present system is so great," said the Duke of Richmond, when introducing his Bill, "that the Government "have thought it necessary to propose legislation." The Bill is supposed to be founded on the report of the Lords Committee; but although it may be said to travel along the lines of that report, we fear lest it should be found to stop short of the goal. It is strange that there should be any risk of such a result, seeing that the Duke of Richmond was Chairman of the Select Committee who made the report. No doubt there are many difficulties in the way, and it is, perhaps, expected that the Local Government Board will take care that the Conservancy districts are made as extensive as possible. The provision for upland, intermediate, and floodland areas in each Conservancy district, shows an intention to comprehend, as far as may be, the whole course of a river. Unless uplands and lowlands are both included, there will be little room for Lord Redesdale's complaint.

What may be the fate of the Bill it is impossible to say. It has to pass the ordeal of the Commons after passing through the Lords, and Parliament is apt to be timorous and vacillating on questions of a sanitary nature. The present Bill, although not directly and advowedly a sanitary measure, partakes very much of that character, and it would be well if the Sanitary Authorities of the kingdom possessed a jurisdiction similar to that which is proposed for the Conservancy Boards. We should like the Bill to pass, as its operation might be instructive in a sanitary sense, besides providing for the prevention of mischievous and destructive floods.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

CLXXIII.

THE TREATMENT OF RESIDUAL PRODUCTS.

The Preparation of Benzole by Coupier's Still.

M. Coupier, the largest aniline colour manufacturer in France, has patented an excellent still for the separation of benzole, toluole, &c., from light naphthas. The patent was taken out by Mr. William Clark as a communication from abroad. It is dated June 5, 1863, No. 1405. The specification contains two plates, but the figures in them are much simpler than those given by MM. Girard and De Laire, *loc. cit.*, evidently indicating that M. Coupier has gradually perfected his invention. In the engraving, fig. 13, the rectifying column, *a*, receives the hydrocarbons in the state of vapour from the still, *c*. The charge of naphtha is inserted at *g*, and heat is obtained by means of the steam coil, *d d*. Supposing the still to be charged with a light naphtha, already purified by means of sulphuric acid and caustic soda, and distilling, say, between 80° C. = 176° Fahr., and 120° C. = 248 Fahr., steam is to be admitted to the coil, *d d*, at a pressure of about two atmospheres. The benzole and toluole rise in the column, and pass through the horizontal diaphragms shown in plan, and in section across the line X Y on the left of the engraving. There are nine of these diaphragms in the still. Three at the top and one at the bottom are marked *b b b b*. They are all of the same form as *b' b'* in the section. The vapour rises through the pipes *q q q q*, which are pierced with holes. In the section, *r r* represent small inverted cups, against which the vapour plays. These cups are represented in the plan at *r r r r*. They fulfil an important function, because the vapours of hydrocarbons tend to condense whenever they play against a metallic surface. If more liquid condenses than is desirable, it overflowes by the tube, *s*, and descends in the column. Two of those pipes are shown in plan, and one in section, in fig 13. It will be seen, from what has been said, that a layer of fluid exists on every diaphragm, and that the vapour has to pass through this fluid; it is thus washed, as it were, and the less volatile vapour is condensed, and, of course, falls back through the overflow-pipe, *s*. This is, in fact, one of the most effectual means of separation known. Linnemann's apparatus for the fractional separation of fluids (Watts's Chem. Dict., 2nd Supplement, p. 436), with which extraordinary results have been obtained, depends on the same principle. In Coupier's still, as in Linnemann's, it is necessary that the liquid should condense faster than it can run back. To prevent this accumulation becoming so great as to render the operation unmanageable, Linnemann removes the source of heat from time to time; and, as his apparatus is of glass, and only intended for the laboratory, the regulation of the distillation is easy. In Coupier's still, the excess returns by the pipes *s* in the section, and *s s* in the plan. In the section, two diaphragms, *p p*, are seen. Their use is better observed from noticing their position in the plan, where they are marked *p p*. It will be observed that they do not reach entirely across the diaphragm; in fact, they force the vapour to take a horizontal route. As soon as the comparatively purified vapour of benzole reaches the pipe, *i*, it enters the condensers, *j j j j*, which are immersed in the tank, *k*, filled with hot water. The heat of the liquid in this tank is regulated by the thermometer, *m*. The liquids condensed in *j* descend back into the still by the return tubes, *l l l l*. If the tank, *k*, be kept at a temperature of 60° to 70° C. = 140° to 158° Fahr., the benzole, and bodies of lower boiling point, pass on to the worm, *n*, and are received in the puncheon.

When the benzole has passed over, the tank, *k*, is heated by the steam-coil, *o o*, to 100° to 105° C. = 212° to 221° Fahr., and the pressure of steam in the still, *c*, is increased to 3½ atmospheres. At first, the toluole which comes over is contaminated with benzole; but, after an interval, comparatively pure toluole rises; and the puncheon which receives the condensed products from the worm, *n*,

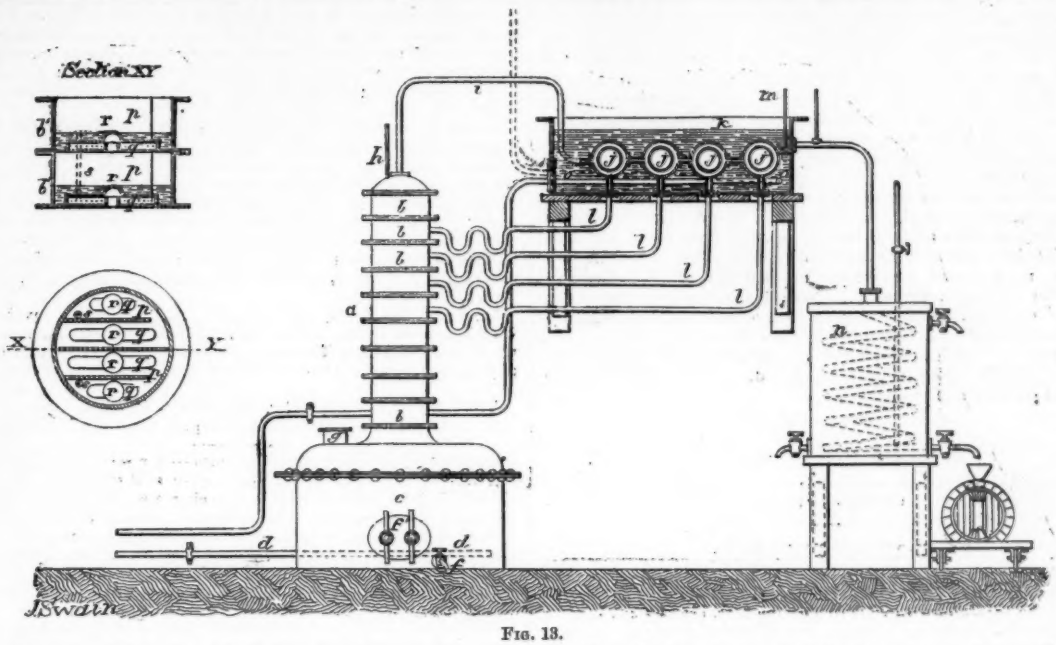


FIG. 13.

must be changed. When the toluole has passed over, xylole and cumole may be obtained by raising the pressure in the worm, *d d*, to seven atmospheres, and heating the tank, *k*, to 138° C. = 280° F., or 164° C. = 327° F. To do this, the tank must be charged with a solution of nitrate of ammonium, boiling at 164° C. = 327° F. But, as this is a troublesome and expensive process, it is, perhaps, better to run out the residue in the still by the tap, *f*, and distil it in a direct current of steam.

The thermometer, *h*, at the top of the rectifying column, is of great use, as it serves to enable the still-man to control the entire operation. When the still, *c*, requires cleansing, the man-hole, *f'*, can be removed for that purpose. If it be preferred to distil over the xylole and cumole in the column, paraffin may be used in the tank, *k*, instead of nitrate of ammonium.

It is, however, proper to mention that a large number of tar distillers still continue to obtain their benzole and toluole, by repeated rectifications in ordinary stills, either in a current of direct steam or with steam coils, or jacketed stills. It is probable, however, that as rectifying columns become improved and simplified, the old methods will fall into disuse.

Benzole, whether prepared by means of a rectifying column or by ordinary stills, must always have its boiling point and specific gravity carefully determined. Too low a boiling point and specific gravity are quite as indicative of impurity as too high, and make us suspect the presence of olefines or non-nitrifiable oils. We shall speak of these again further on. From this it will be seen how narrowly the progress of the distillation must be watched, and how constantly the products must be tested in the laboratory.

PROPERTIES OF BENZENE AND TOLUENE, AND TESTS FOR PURITY.

A complete history of the properties of benzene would be out of place in this work; but there are a few which it is proper for the tar distiller to be acquainted with.

Its chemical formula is C_6H_6. Its boiling point has been stated to be as low as 80° C., and as high as 86° C., by different observers. We shall adopt the number 80° C., = 176° Fahr., which is, we believe, correct to within half a degree Centigrade.

Its specific gravity at 15° C. = 59° Fahr., is 0·8833; and at 0° C. = 32° Fahr., is 0·8995, according to Longuinine, and, at the same temperature, according to Kopp, 0·8991. Faraday and Mitcherlich make it, at 15·5° C. = 60° Fahr., 0·8500. This is more in accordance with the specific gravity of commercial benzole than the numbers given by Longuinine. We have stated that, by benzole, we mean a commercial, and, consequently, an impure product. The tar distiller must not, therefore, expect to obtain a density of 0.8833, except with pure benzene.

Benzene is formed in a great number of chemical reactions, especially at high temperatures; they will not, however, be described here, as they are of little interest to the tar distiller, unless he be a scientific chemist, in which case he is referred to treatises on organic chemistry.

Almost all specimens of benzole contain small quantities of homologues of olefiant gas; these lower the specific gravity. Their presence may be demonstrated by their rapidly decolorizing bromine water. A low specific gravity is also frequently observed if the benzole has been made from a tar produced from coals of the cannel class. In this case, in addition to homologues of olefiant gas, there will be found what are called in commerce non-nitrifiable oils. These consist of a class of hydrocarbons known as the paraffins. They may be detected by heating the benzole in a stoppered flask, with a mixture of equal parts of sulphuric and nitric acids. The portion which rises to the top on standing is to be treated again and again until it no more diminishes in volume. It may then be measured, and its quantity thus determined. During the treatment, the flask must be agitated and cooled, by dipping it in cold water. The presence of the paraffins, as well as the homologues of olefiant gas, lowers the specific gravity of the benzole.

When it is desired to obtain a small quantity of pure benzene from coal naphtha, to serve as a standard, recourse must be had to crystallization. It is a fortunate circumstance that benzole cooled to 0°C = 32° Fahr., freezes into a solid substance. Pure crystallized benzene melts at 5·5° C. = 42° Fahr. To obtain the benzene from commercial benzole, a highly rectified product should be exposed in thin glass or metallic vessels to a freezing mixture. Pounded ice or snow, to which common salt has been added, answers very well. The vessel containing the benzole, having been surrounded by the mixture, the whole apparatus should be placed in a box, or other convenient receptacle, and be packed with sawdust. When no more solid appears to be formed, the frozen portion should be placed on a funnel and drained. The liquid that first comes away is to be rejected; the remainder will be comparatively pure benzene. A repetition or two of the process will render it almost perfectly pure. It may then be kept as a standard, and it should distil between 80° and 81° C. = 176° and 177·8° Fahr.

When absolutely pure benzene is to be made on the large scale, it is purified by cooling in a Carré's or other refrigerator until it has solidified. The crystalline mass is pressed rapidly, melted, and again subjected to a similar process.

When benzole is to be purified on the large scale by distillation only, the rectifying column of Coupier, previously described, may be employed with advantage.

The properties of toluene are, from the chemist's point of view, very different from benzene; inasmuch as it yields three isomeric toluidines, whereas benzene gives but one aniline. Its formula is C_7H_8, its specific gravity at 15·5° C. = 60° Fahr. is 0·8654, and it boils at 111° C. = 231·8° Fahr. Its use has much extended of late years, as, by treatment with chlorine at temperatures between 110° and 140° C.= 230° to 284° Fahr., it yields chloride of benzyl, which is much used in obtaining the bluest shades of methylaniline violets.

Toluene does not freeze even when cooled to — 20° C. = 4° Fahr.

"GAS IN THE HOUSE" is the title of an unassuming little work which has been published by Mr. Faraday, of Berners Street, London, with the object of instructing householders in the elements of gas-fitting as it ought to be done. The author, who is practically acquainted with the subject on which he writes, takes his readers through every part of a good class dwelling-house, and discourses pleasantly enough on the special requirements of each in the matter of artificial illumination. While it cannot be said that there is much that is novel in his remarks, they are based on sound sense, and a knowledge of his views would be a great help to that large and increasing section of the well-to-do public who take an interest in the arrangement of their habitations, and who rightly consider that the individual who lives in a house ought to be able to direct some of the fittings and appliances which are intended for his own use and convenience. Among other things, Mr. Faraday recommends that basement and kitchen fittings should be of iron, mounted in strong brasswork, instead of the all-brass articles usually supplied for such purposes. While confessing that these fittings are frequently much too flimsy and light, we scarcely think the ponderous and costly kind of goods he advocates would be generally approved of. Good and strong brass fittings can be obtained to answer every necessary requirement in such cases, and would probably be preferred. He recommends Argand burners in the living-rooms, and certainly with much reason. At the same time, there are a few drawbacks to the general use of these burners, which go rather against them in public esteem. The chimneys are somewhat of a nuisance, and although the light burns very steadily in a still room, it is apt to flicker unpleasantly when there are currents of air caused by opening

doors, &c. The author's remarks on the electric light are sensible, and he is not such a thick-and-thin advocate of gas as to be oblivious of the decorative value of candles in a drawing-room. This is as it should be, for his candour in this particular does not prevent his being a firm supporter of gas as the best artificial illuminating agent for general purposes extant. The necessity of efficient ventilation is not lost sight of in the discussion of the vexed question of the damage caused to books, &c., by gas, and any one who thus insists upon such a prime essential in securing for gas the fair play it ought to receive, performs a public service. People seem to forget that if they have the advantage of the light of 20 or 30 candles in an apartment, they ought to provide more air than would be necessary for just as many candles as they have gas-jets. Handy books of this class are likely to fall into the hands of those who would never think of looking up a formal treatise for information; and with the conviction that the more there is known of gas, the more likelihood there is of its retaining the favour of such of the public as seem inclined, under the influence of a fashionable mania, to go back to the use of lamps or candles, we should be pleased to see such simple guides as Mr. Faraday's widely circulated, and the rules that he enunciates generally followed.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by Correspondents.]

LOW-PRESSURE BURNERS.

Sir,—Your correspondent, Mr. George Bray, has left untouched the plain statement of facts and the argument contained in my last latter. Therefore, the assertion with which he commences, that he has set me right—by which, I suppose, he means he has proved me to be wrong—is without foundation.

He then makes a show of careful examination into facts, by comparing the reports which appeared in the *Society of Arts Journal* and the Journal of Gas Lighting; yet, notwithstanding this, he gives a most inaccurate and unfair quotation—in inverted commas—from my letter. On this quotation, arranged to suit his views, he hangs an argument, which necessarily fails by reason of this inaccuracy, and winds up with an erroneous assertion, imputing to me a statement which I never made. Therefore, at present, my statement, supported by the highest authority, that "the Sugg-Letheby burner was the first step in the direction of properly consuming gas at low pressure," remains undisturbed. If there had been anything wrong in this statement, it could not have failed to have been corrected by some of the many scientific men present at the Society of Arts meeting, including the lecturer himself, who is thoroughly well acquainted with all the details of the history of gas improvements.

The following paragraph of your correspondent's letter, which contains another garbled statement, can only be understood by assuming that he considers "incidentally" and "accidentally" to be synonymous terms. Incidentally to the main question on which I was asked by the Chairman to speak, I quite deliberately stated that I was the inventor of the hollow-top steatite burner, and every one present knew that I referred to the *steatite* burner, because I pointed to one which was before the audience, and made a sketch of it on the black-board, showing its internal and external conformation. This claim your correspondent is not disposed seriously to deny, for he admits that "if Mr. Sugg had simply claimed, in his original statement, the invention of the hollow-top steatite burner, my first letter would not have been penned."

After this admission, the further remarks of your correspondent can possess no interest, excepting as an illustration of the old proverb that "a man convinced against his will, is of the same opinion still." The hollowness of his argument is sufficiently demonstrated by the advertisement given in his first communication to your Journal, that "last year I (Mr. G. Bray) took out patents here, and in several foreign countries, for manufacturing the same burner from my own material—enamel." Thus, although I brought out the hollow-top steatite burners before 1872, yet he has only lately discovered that they are good burners, and hastens to patent the discovery.

To my statement, clearly showing that I do manufacture steatite burners in this country, he rejoins that this cannot have been going on long, because I stated in evidence (in June, 1875) that my steatite burners were made in Germany. I cannot find, on the Judge's notes, that I did say so. But since that time the manufactory of steatite burners—both Argand and flat-flame—has been established in Vincent Street, as I have stated. In addition to those I manufacture, I take a great many from Germany, which are always made from my own models, and are made solely for me. They cannot be obtained from any one except myself or my agents. But as I have been for many years engaged in perfecting the manufacture of all kinds of burners, and have been continually in the habit of sending models to Germany to be reproduced in steatite, it necessarily follows that imitations of my models are made by other makers, and can be procured independently of me. I can only say that a better proof of the goodness of my models cannot be adduced.

Your correspondent states, in the concluding portion of his letter, that he does not know what is the difference between enamel and adamas. I find, by reference to his patent, No. 2335, dated 1872, lines 9 and 10, these words:—"This class of tip is known in the trade as 'enamel,' 'adamas,' &c." This, I presume, fully answers my question. With respect to steatite, he says he knows that *both* are superior to steatite, "because of the fractures invariably found in it and the burners made from it, and its extreme brittleness when burned and cast into burners."

Now, the steatite I employ for my burners is of a very superior quality, and contains *no* fractures. It does not appear, from trials I have made, to be quite so brittle as "enamel" or "adamas." In my process of manufacture it is not "burned and cast into burners." Only the real stone itself is used, and no made-up material. Hence the well-known superiority of these burners. I have not found his "enamel," or *any* "adamas" burners to give a higher illuminating power than those made from steatite, although I have carefully tried a great many, including those of the latest date of manufacture. But this point will be examined by the Committee appointed by the British Association to make a report on gas-burners, and I am content to leave the matter to them.

In using the term "illuminating power," I follow the lead of the highest scientific authorities. Mr. Bray thinks proper to change that accepted expression, for probably the same reason as he has changed the name of the "Hollow-top burner" to the "Slit union." The term "lighting power" is, in my opinion, no improvement on "illuminating power." "Lighting power" may not be "illuminating power;" as, for example, a burner is now sold which possesses great "lighting power," but has no illuminating power. It was shown at the South Shields Exhibition of Gas Apparatus, and was well spoken of. It is used for lighting fires.

In conclusion, I beg to apologize for the large amount of your valuable space I have taken up in this discussion, which apparently would not have arisen if it had not been for the very regrettable absence of your correspondent from the meeting at the Society of Arts.

William Sugg.

Vincent Works, Westminster, S.W., March 21, 1879.

[This correspondence must now cease.—Ed. J. G. L.]

Gaseous Fuel for Heating Retorts.—Our esteemed correspondent, Mr. W. Mann, writes:—"Mr. Newbigging said the other day at Manchester that he did not despair of seeing a radical change effected in the mode of carbonizing. The system of heating retorts with gaseous fuel, with its attendant cleanliness and economy, cannot fail to make progress, now that there is awakened interest in the subject. This is really the case in America, for Mr. T. F. Rowland, of the Continental Iron-Works, Brooklyn, New York, after speaking of some new settings of 9-feet retorts, six in a bed, that are in 24 hours turning out 8500 cubic feet of 16-candle gas per mouthpiece, goes on to say in the same letter, 'We are now working at a scheme to reduce the labour and wear and tear of the same, by burning carbonic oxide instead of coke in the furnaces, using the coke or breeze in a sort of gasogene, and conveying the carbonic oxide there made to the benches by means of fire-clay lined iron-pipes.' Now, as Mr. Rowland was the builder and, to a great extent, the designer of the Municipal Gaslight Company's works, New York, described in your Journal for the 16th of July last year (Vol. XXXII., pp. 87, *et seq.*), he already possesses the knowledge necessary for the production of carbonic oxide on a large scale by the best 'decomposing furnaces,' called 'gasogenes,' that have ever been brought into practical use. He has also, by experiments, furnished himself with data to show that the heats can be more evenly regulated, and a produce of from 20 to 25 per cent. more gas obtained from a bench of retorts in a given time."

Parliamentary Intelligence.

HOUSE OF LORDS.

Monday, March 17.

Conservancy of Rivers Bill.—On the motion for the second reading of this Bill, it was, after a short discussion, committed.

Tuesday, March 18.

The Llandudno Improvement Bill was reported from the Select Committee, with amendments.

Thursday, March 20.

The Colwyn Bay and Pwllycrochon Estate Bill was referred to a Select Committee, consisting of the Duke of Bedford (Chairman), Lord Dorchester, Lord Saltersford, Lord Colchester, and Lord Sudeley; to meet on Tuesday, March 25.

HOUSE OF COMMONS.

Monday, March 17.

A petition against the Liverpool Lighting Bill was presented from the Preston Gas Company.

Requisitions to withdraw their petitions against the following Bills were presented:—Glossop Gas, from (1) Hollingworth Gas Company, (2) Hollingworth Local Board; Westgate and Birchington Gas and Water, from Margate and Broadstairs Water-Works Company.

Tuesday, March 18.

The Examiners reported that Standing Order No. 63 had been complied with in the case of the Queenstown Gas Bill.

Bills reported:—Nottingham Water; Tipton Local Board.

Requisitions to withdraw their petitions against the following Bills were presented:—Nottingham Water, from Midland Railway Company; Pemberton Local Board, from Lancashire and Yorkshire Railway Company; Stratford-upon-Avon Corporation and Local Board of Health, from the Postmaster-General.

The Glasgow Corporation Water Bill was referred to a Select Committee, consisting of Admiral Egerton (Chairman), Lord Claud Hamilton, Sir Edmund Lechmere, Mr. G. Palmer, and Mr. Bonham-Carter (Referee); to meet on Tuesday, March 25.

THE DEATH-RATE OF THE METROPOLIS.

Sir U. Kay-Shuttleworth asked the President of the Local Government Board whether it was true that the Registrar-General had reported that the death-rate of the Metropolis, which was 22·3 in every thousand in 1876, and 21·9 in 1877, had risen in 1878 to 23·5 in every thousand; whether this increase was almost entirely due to zymotic diseases; whether the death-rate had risen to a still higher figure in recent weeks (29·2 in that ending March 8th); whether Dr. Frankland had reported that during the past year the quality of the water delivered by the companies who derived their supply from the Thames was inferior even to the unsatisfactory water supply of recent years; and whether the Local Government Board had taken any action in consequence of these reports.

Mr. Sclater-Booth, in reply, said that the death-rate of London was 23·3, 22·3, and 21·9 per 1000 in the years 1875, 1876, and 1877 respectively, and it rose to 23·5 in 1878. During the first ten weeks of this year, influenced by the severe winter, the death-rate had been 26·3 per 1000. The average annual death-rate in London, taking the last eight years, was 22·8, against 23·6 and 24·3 in the two preceding decades of 1861-70 and 1851-60 respectively, showing an actual recent decline. About one-third

of the increased death-rate in 1878, as compared with the exceptionally low rate in 1877, was due to zymotic diseases, and those were principally whooping-cough and diarrhœa. The marked excess of mortality in the first ten weeks of this year was in no way due to zymotic diseases. The annual zymotic death-rate in London in the eight years 1871-78 had averaged 4·0 per 1000, against 4·5 and 4·9 in the two preceding decades. In reply to the second part of the question, Dr. Frankland had reported that with one exception—viz., 1872—the Thames water last year was more polluted by organic matter than during recent years, and that, owing to the frequent heavy floods, the water was extremely difficult to filter. The efficiency of filtration, however, during 1878, as ascertained by the monthly analysis of the Local Government Board's Examiner, showed that out of 60 samples of the water of the five Thames Companies in that year, 48 were clear and transparent, whereas it appeared that during the six preceding years the average result was that out of the 60 samples, 42 only were clear and transparent. The Local Government Board had no power to enforce a supply of water from any fresh source, their powers being chiefly limited to seeing, through their officer, the Water Examiner, whether the water was, as far as practicable, properly filtered. They had not failed to impress upon the Companies the necessity of adopting all necessary improvements, and during the last two years the five Thames Companies had expended upwards of £400,000 in constructing improved reservoirs and filter-beds. Many of these new works were now either completed, or in a very advanced state.

WEDNESDAY, MARCH 19.

Bill read a second time and committed:—Imperial Continental Gas Association.

Bills reported:—Bury St. Edmund's Gas; New River Company.

Bill reported without amendment:—Grand Junction Water. Bill to be read the third time.

The Aldrington Water Bill was reported, "Preamble not proved."

THURSDAY, MARCH 20.

The Examiners reported that Standing Order No. 63 had been complied with in the case of the Morecambe Gas Bill.

Bills reported:—Nelson Local Board; Pemberton Local Board.

METROPOLIS GAS AND WATER SUPPLY.

Sir U. KAY-SHUTTLEWORTH asked the Secretary of State for the Home Department, with reference to what he said in his speech of the 5th of April last session—viz.: "No one could hold the office which he had the honour to fill and refuse to admit that there were great faults in the government of London; he would go further, and say that there were questions connected with it which must undoubtedly be settled, seeing that Bills had been introduced by the Metropolitan Board of Works for taking upon itself the whole of the water and gas supply of London, and taking into account the report of the Fire Brigade Committee which sat one or two sessions ago,"—whether, having made this statement, and, further, having, on behalf of Her Majesty's Government, been the cause of the abandonment, both last session and again this year, of the Metropolitan Board's Bills for dealing with the water supply of London, he intended to make any legislative proposals on these subjects during the present session.

Mr. CROSS, in reply, said he was glad to find that the words he used last year had made such an impression, and it was not his wish or intention to retract any of them. Since he made the speech referred to, he had been in constant communication with his right honourable friend the President of the Local Government Board, and the matter had certainly not been lost sight of. The subject was one that required very careful consideration, and he could not promise any immediate legislation.

FRIDAY, MARCH 21.

Bill reported:—Westgate and Birchington Gas and Water.

A requisition to withdraw their petition against the Sleaford Water Bill was presented from the Great Northern Railway Company.

LIVERPOOL LIGHTING BILL.

The CHAIRMAN of WAYS and MEANS gave notice that on Monday, March 24, he would move—"That the order that the Liverpool Lighting Bill be committed to a Select Committee of seven members, four to be appointed by the House, and three by the Committee of Selection, be read and discharged."

SATURDAY, MARCH 22.

Manchester Corporation Water Bill.—A petition against the Bill was presented from the Hyde Local Board (against alterations), and a requisition to withdraw her petition was presented from the Countess Ossalinsky.

Mr. SHAW-LEFEVRE gave notice that on the second reading of the Nottingham Corporation Bill, which is fixed for Monday, March 24, he would move—"That it be read a second time upon this day six months."

COURT OF REFEREES.—THURSDAY, MARCH 13.

(*Before Mr.* RAIKES, M.P., *Sir* J. DUCKWORTH, *Mr.* RICKARDS, *and Mr.* A. BONHAM-CARTER.)

TIPTON LOCAL BOARD BILL.

Mr. R. W. COOPER appeared for the promoters; Mr. PRITCHARD for the Corporation of Birmingham, who petitioned for *locus standi* to oppose the Bill when it comes on for hearing before a Select Committee.

Mr. PRITCHARD, in stating the case of the Corporation of Birmingham, said the Bill was promoted by the Tipton Local Board of Health, to acquire certain lands for the purposes of their gas undertaking, and for other purposes, while the gas limits of his clients extended to and included the district of the Tipton Local Board. In 1875 the Corporation of Birmingham bought the undertaking of the Birmingham and Staffordshire Gas Company, their Bill containing a provision empowering any Local Authority within the gas limits to purchase such part of the undertaking as affected their district, on obtaining Parliamentary powers for the purpose. In 1876 the Tipton Local Board obtained power to purchase the part of the undertaking running through their district, and also a piece of land necessary for the erection of gas-works to supply the district. As soon as their Act received Royal Assent, they gave notice of their intention to purchase; but as several nice points of law arose, the matter had to go to arbitration, and no settlement had yet been arrived at. The object of the present Bill was to substitute for the piece of land scheduled under the Act of 1876, another piece which was deemed more suitable for the purpose. Clause 14 of the Act of 1876 provided that the Local Authority should not make or sell gas until the vesting period had elapsed—such vesting period not to expire until the execution of the deed of transfer and the payment of the purchase-money, to be followed by the vesting of the property in the hands of the Local Board. He wished to direct the attention of the Court to this clause and the proviso concerning payment, because it was proposed to omit this proviso from the present Bill, and to repeal such portions of the Act of 1876 as were inconsistent with the clause now proposed to be enacted. On this ground he held that the Corporation of Birmingham were entitled to a general *locus standi* in opposition to the clauses. The Bill was in many respects open to objections, mainly on the ground that it would involve the petitioners, as owners of the Birmingham and Staffordshire Company's undertaking, in large and unnecessary expense in respect of their distributing mains.

Mr. COOPER, for the promoters, opposed the application, on the ground that the only proposal in the Bill was to take power to substitute certain lands for those scheduled under the Act of 1876, and that, therefore, the Corporation of Birmingham could not be injured in any way; in addition to which there was contained in the Act a clause precluding the Corporation of Birmingham from opposing any future Bill promoted by the purchasing Authority, except upon clauses. It was urged that there were contained in the Bill certain words tending to prejudice the rights of the petitioners. He did not know whether that was or was not the case; but if it was, the complaint would only weigh against existing Acts, the words of which had been followed most scrupulously.

Mr. RICKARDS pointed out that, as the Bill was drawn, it seemed to repeal the proviso to clause 14 of the Act of 1876, which provided that the Local Board should only be entitled to sell gas after they had paid the purchase-money, and the property was vested in them.

Mr. COOPER said there was no desire to make any such provision. It was only proposed to repeal such parts of clause 14 of the 1876 Act as were inconsistent with the purposes of the present Bill; and, as he had said, the only object of the Bill was to substitute certain lands for those which were scheduled under the Act of 1876. If it was thought that the Bill, as drawn, would do more than this, he had no objection to the Corporation of Birmingham being allowed *locus standi* as far as this particular matter was concerned, and set forth in clause 7 of the Bill.

Mr. RICKARDS pointed out that clause 7 meant almost the whole Bill, and he thought it hardly worth while to make a distinction.

Mr. PRITCHARD said he should be willing to accept a general *locus standi* as far as the clauses were concerned. He had no intention to oppose the preamble of the Bill.

After a lengthy conversation, the Court decided to allow the Corporation of Birmingham a general *locus standi* to oppose the clauses of the Bill; but they have since withdrawn their petition.

Legal Intelligence.

HIGH COURT OF JUSTICE—COMMON PLEAS DIVISION.

FRIDAY, MARCH 14.

(*Before Lord Justice* BRAMWELL *and Justice* LOPES.)

SHEFFIELD WATER-WORKS COMPANY *v.* WILKINSON.

THE SAME *v.* CORBRIDGE.

THE SUPPLY OF WATER IN CASES OF INSOLVENCY.

These were cases in which the Sheffield Water-Works Company had been summoned for refusing to supply defendants premises with water. The cases were heard before the Stipendiary for Sheffield in December last, and were reported in the JOURNAL, Vol. XXXII., pp. 852, 888, the result being that the Company were fined, in each case, £10, and £2 a day for the time they continued to withhold the supply. Against this decision the Company appealed.

Mr. CAVE, Q.C., and Mr. CYRIL DODD appeared for the appellants; Mr. TENNANT for the respondent Wilkinson; but no Counsel appeared for Corbridge.

Mr. CAVE said this was a special case stated for the opinion of the Court by the Stipendiary Magistrate for Sheffield, the question involved being as to the proceedings to be taken when the water had been cut off by the Company in consequence of default in the payment of rates. In October, 1877, communication-pipes were laid down by the Company to houses in Barber Road and Kay Place, Sheffield, and as the houses were of less value than £10 per annum, the owners had to pay the water-rates prescribed by the Water-Works Clauses Act. A person named Kay owned the houses early in 1878, and by the Act of Parliament he was bound to pay the rates in advance. At Lady-day he did not pay the rate up to the ensuing Midsummer, and at Midsummer he neither paid the rate in advance nor the one for the past quarter. On the 6th of August he filed a petition in bankruptcy, and it was then discovered that the houses were mortgaged to the Alliance Benefit Building Society, who thereupon assumed possession. On the 7th of August the Water Company gave Kay notice that if he did not pay the rates the water would be cut off. A correspondence ensued, and ultimately the water was cut off. On the 6th of November the mortgagees sold the property to Mr. Wilkinson, the respondent, who, a few days afterwards, requested the Company to reconnect the water. The Company replied that they could not do so until their claims had been satisfied. The respondent said he failed to see what right the Company had to act in this manner, and requested them to supply him with water, he being ready to pay for the connection and a quarter's rate in advance. The water was not laid on, whereupon the respondent took proceedings against the Company before the Magistrate to recover a penalty of £10 and of 40s. per day for 14 days default in supplying the water. At the hearing, the Stipendiary said his construction of the Act of Parliament was that the respondent was in no way liable for the arrears of rates, the liability attaching to the occupier at the time, or to the owner, who stood in his shoes. The Company were wrong in stopping the water as against a person who was not in default, and he fined them in the full amount of the penalty. He (Mr. Cave) submitted that this decision was wrong. According to it, if a householder refused to pay his rate for the current quarter, and the Company cut the water off, the next day he could go to the Company and tender the rate, whereupon the penalty of £10 would immediately accrue, together with £2 per day until the water supply was restored. If that were so, the remedy in the hands of the Company for securing the payment of rates would be worse than the disease, as the quarter's rate in this instance only amounted to 2s. 6d. The power of cutting off water was obviously given to the Company to compel people to pay their rates; but if their lordships held the Magistrate's construction of the 43rd section of the Water-Works Clauses Act to be correct, the Company would be precluded from asserting their claims. The contentions of the Company were—(1) That they were not bound to restore the water, after it had once been cut off, until the money which had become due had been paid; and (2) assuming they were bound to restore the water, it could only be under the 45th section, and not the section under which the respondent had proceeded.

Mr. TENNANT submitted that the decision of the Magistrate was right.

Their LORDSHIPS said the question was a somewhat difficult one, and they would take time to consider their judgment.

Mr. CAVE, Q.C., said that Corbridge's was also a special case stated by the Stipendiary Magistrate for Sheffield, and it differed very slightly in its features from the previous appeal. In this instance it was not the owner, but the receiver in bankruptcy of the occupier, who had taken proceedings, and the Company had been ordered to pay something like £30. The respondent sent in a bailiff to take possession of the house for the benefit of the creditors, and he demanded that the water should be reconnected. He did not tender the expense for restoring the communication, and the Company thereupon refused to comply with the demand. The house was above the

value of £10 a year. He (Mr. Cave) maintained that the decision of the Stipendiary Magistrate was clearly wrong under the Act of Parliament.

Their LORDSHIPS said they would reserve judgment in this case also.

TUESDAY, MARCH 18.

Lord Justice BRAMWELL said he had come to the conclusion that the convictions could not be sustained. The informations were founded upon the 43rd section of 10 & 11 Vict., cap. 17, which said that if a company neglected or refused to furnish water to any owner or occupier who was entitled under the Act to receive a supply during any part of the time for which rates had been tendered, they should be liable to a penalty of £10, and £2 per day for the period during which the neglect continued. The question to be decided was whether the Company had refused to furnish water to persons who were entitled under the Act to receive a supply. He would treat the conduct of the Company as equivalent to a refusal; and the question then was, whether the respondents were persons entitled under the Act to receive a supply. A person to be entitled must be entitled under the Act of Parliament, because there was no natural right to be supplied with water. Persons might be entitled under the Act in two classes of cases. In a case where the house was of less value than £10 a year, the Act said that the Company should lay down supply-pipes in response to a requisition, and that after that had been done the occupier should be entitled to receive a sufficient supply of water. When the house was worth more than £10 per annum, the occupier or owner could, if it were so wished, lay down the pipes himself. Wilkinson came under the first category, and Corbridge under the second; and if they paid their rates, they were entitled to demand and receive a sufficient supply of water. If the matter stood there, it was quite clear that the Company would have incurred the penalty which the Magistrate had inflicted upon them. But the 74th section said that if the person who was supplied with water, or who was liable to pay the rate, neglected to pay the rate—which was the case here—the Company might cut off the water. The Company did cut off the water, and they could not supply it again until the communication was restored. He could not find anything in the Act of Parliament to compel them to go to the expense of restoring the communication without any means of being repaid the outlay. That seemed to him to put an end to the case. It might appear hard that the owner of a house should be exposed to the risk of losing the water supply if the occupier merely neglected to pay a quarter's rate; but, on the other hand, it would be hard on the Company if, after they had exercised their right to cut off the water owing to the default of the occupier, they were compelled to restore the communication without compensation. In the case of a house worth over £10 a year, where the communication-pipes had been laid down by the owner himself, there was nothing to prevent him doing the thing a second time. It was quite clear that the Act of Parliament contemplated that the pipes might be severed; there was nothing to prevent the owner restoring the communication, and there was nothing to compel the Company to restore. His judgment did not proceed on the assumption that the Company had a right to withhold the communication until the arrears of rates had been paid. That had possibly been their custom, but it was not sustainable. He quite agreed with the Magistrate that there was ample provision in the statute to prevent the Company from being money out of pocket, because they were entitled to have the rates paid in advance. The Magistrate thought the Company were bound to restore the communication, but in that opinion he could not concur. He did not consider that the Company had any lien for arrears of rates. If the current rate had been tendered to them before the water was stopped, they would have had no right to cut off the water, although the anterior arrears might be still due. The appeal, therefore, must be allowed, and with costs, as the respondents had chosen to proceed against the Company in a very hostile manner in order to recover heavy penalties.

Justice LOPES was of the same opinion, but remarked that he thought the Legislature had intended that the liability for the payment of rates should be personal, and not attach to the property. A person whose water had been cut off for non-payment of rates, was not, in his view, a person entitled to receive a supply within the meaning of the Act. Section 43 of the Water-Works Clauses Act referred to cases of improper refusal or neglect by the Company to supply water when the communication was intact, and had not been interrupted by the misfeasance of the person supplied. If the construction contended for by the respondents were allowed, the occupier of a house might contemptuously refuse to pay the rates, and, immediately after obliging the Company to cut off the water, tender the rate, and proceed for penalties.

Mr. TENNANT applied for leave to appeal in the case of Wilkinson, as that case would govern a great many others.

The Company's appeal was, therefore, allowed, with costs; but leave was given to the respondent Wilkinson to proceed to the Court of Appeal.

TORQUAY COUNTY COURT.—SATURDAY, MARCH 8.

(*Before Mr.* M. FORTESCUE, *Judge, and a Jury.*)

THE TORQUAY GAS COMPANY *v.* CARTER.

Mr. BAKER appeared for the Gas Company; and Mr. CARTER conducted his own case.

This was an action in which Mr. *Frederick Roger Carter*, a solicitor practising in Torquay, was summoned by the Torquay Gas Company for the sum of £7 15s. 10d. for gas supplied from Jan. 5, 1877, to Jan. 5, 1878. The original amount due from defendant was £10 8s. 9d., but £2 12s. 11d. had been paid into court by order of the Justices. A counter-claim of £30 was set up by the defendant for damages alleged to have been caused to his house by the supply of impure gas by plaintiffs, and by plaintiffs illegally cutting off the supply. The counter-claim was not, it was alleged by plaintiffs, set up until the gas was cut off on account of non-payment of their account against the defendant, who, though repeatedly applied to for the money, failed to pay it; hence the action. Defendant had been a consumer of plaintiffs gas for many years, and evidence was brought to show that the gas supplied to him was up to the standard of purity required by the Company's Act, and that, in removing the meter, plaintiffs had not exceeded their legal powers. The gas was characterized by the defendant as "dirty," and he had made many complaints to the Company's late Manager (Mr. Gardner) on this account.

The JURY found for the Company for the full amount claimed.

DAMAGING A STREET-LAMP.—At the Ilkeston Petty Sessions, on Thursday, March 20, Denis Casey and William Macdonald were charged with damaging a street-lamp, the property of the Ilkeston Local Board, on the 12th of March.—Mr. Lissett, the Clerk, conducted the case on behalf of the Board, and called Edward Wharton, who deposed to seeing the defendants throw at a lamp on the Nottingham Road, thereby breaking the glass, valued at 2s. 6d.—The defendants were fined 5s. each, 1s. 3d. for the damage done, and 7s. 6d. each for costs, or 14 days.

GODALMING GAS COMPANY.—The annual meeting of this Company was held on Monday, the 10th inst., when dividends of 5 per cent. per annum on the preference, and 6 per cent. on the ordinary shares, were declared.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

The following is Dr. Whitmore's report on the illuminating power, pressure, and quality of the gas supplied by The Gaslight and Coke Company to the parish of Marylebone during February:—

FEBRUARY.	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon. in 100 Cu. Ft.	Sulphuretted Hydrogn.
	*Mean of 23 Obser.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Gas supplied from the Fulham works . .	16·41	17·64	15·61	25·00	14·37	14·83	0·56	No trace
Gas supplied from the Beckton and Bow works	16·43	17·14	15·80	29·37	17·10	11·33	0·36	No trace
Cannel gas supplied from the Pimlico works	20·76	21·81	19·80	22·10	11·68	19·16	0·50	No trace

Mean of daily readings of barometer . . . 29·17
" " " thermometer . . . 57·61

*Each observation consists of ten readings of the photometer, at intervals of one minute.

The mean illuminating power of the common gas supplied to the parish was a little below 16½ candles; four times the Fulham gas, and twice the Beckton and Bow gas fell slightly below the standard. On three occasions the gas from both these works was over 17 candles. The cannel gas was twice below the legal standard, but it was also eight times considerably more than a candle above it. The mean amount of sulphur found in 100 cubic feet of the Fulham gas was 14·83 grains; in the Beckton and Bow gas it was 11·33 grains; and in the Pimlico (cannel) gas, 19·16 grains. In neither of the gases did the ammonia exceed, but to a trifling extent, half a grain. The pressure of all the gases was very satisfactory, and no trace of sulphuretted hydrogen was detected in either of them by the ordinary tests.

METROPOLIS WATER SUPPLY.

Lieut.-Col. Bolton, in his report for February, says: "The state of the water in the Thames at Hampton, Molesey, and Sunbury (where the intakes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, Chelsea, and East London Companies are situated), was good from the 1st of February to the 5th; it then became turbid, and remained in a bad condition until the 15th, after which it improved, and continued in a fair state during the rest of the month. The highest flood state of the river at Hampton during the month was 4 ft. 6 in., and the lowest 5 in. above the summer level. The water in the River Lea was turbid during the greater part of February."

The following is Dr. Whitmore's report on the composition of the water supplied to Marylebone during February:—

FEBRUARY.	In Grains, per Gallon.							In Parts, per Million.		In Degrees.	
	Total Solid Matter.	Loss by Incineration.*	Chlorine.	Equal to Chloride of Sodium	Nitrogen as Nitrates and Nitrites.	Oxygen required for Oxidizable Matter.	Estimated Organic Matter.	Free Ammonia.	Albuminoid Ammonia.	Hardness.	Hardness after Boiling Fifteen Minutes.
West Middlesex	21·70	0·90	1·14	1·88	·097	·062	·496	0·02	0·09	14·9	4·0
Grand Junction	21·30	1·04	1·17	1·91	·109	·074	·592	0·01	0·09	14·7	3·8
River Thames at Hampton .	23·00	1·20	1·26	2·08	·084	·101	·808	0·08	0·19	15·9	4·8

* The loss by incineration represents the amount of organic and other volatile matters contained in the Imperial gallon (70,000 grains) of water. The total solid matter, *minus* such loss, consisted chiefly of carbonate of lime, with small quantities of other equally harmless salts.

The water as drawn from the mains of both Companies was clear; that taken from the River Thames was turbid, and of a clay colour.

MORECAMBE GAS COMPANY.—The twenty-first annual meeting of this Company was held on Friday, the 7th inst.—Mr. W. Roper in the chair, who, in moving the adoption of the Directors report, said he could not do less than congratulate the Shareholders upon the very healthy condition of the Company. Although there had been a year of unprecedented depression in trade, the Company had no occasion to complain of any depreciation in their receipts. On the contrary, they were in a position to pay a dividend equal to 10 per cent., and shortly, he hoped, the prospects of the Shareholders would become brighter. Owing, however, to the prospect of the Company becoming a statutory undertaking, and the necessary bills they had to pay in order to carry out that object, the Directors thought it prudent to reduce the dividend on that occasion, with the view, if possible, of equalizing it for the coming year or two. Mr. Briggs seconded the motion, which was agreed to, and a dividend of 8 per cent., free of income-tax, was declared. The meeting was afterwards made special, and the Bill which the Company are promoting in the present session of Parliament was submitted and approved of.

THE PROPOSED PURCHASE OF THE MARGATE WATER-WORKS BY THE TOWN COUNCIL.—At a meeting of the Water Company, on Saturday, the 15th inst.—Alderman Pickering, J.P., in the chair—it was unanimously resolved, on the motion of the Chairman, seconded by Mr. J. T. Friend, J.P.—"That the Directors be, and they are hereby empowered to sell to the Mayor, Aldermen, and Burgesses of the borough of Margate, acting by the Council as the Urban Authority of the said borough under the Public Health Act, 1875, the entire property and interest of the Company, with all their rights, powers, and privileges, for the sum of £59,000, and according to the terms of the contract as approved." The Chairman stated that the Council would pay by debentures, at 4½ per cent. It was proposed, he added, that holders of original £10 shares should receive £30 for each share. They were now receiving 10 per cent., but, by that arrangement, at 4½ per cent., every £10 share would give 13½ per cent. The holders of £2 shares, which had always borne 10 per cent., would receive £5, which, at the rate of 4½ per cent., would give 11¼ per cent. Then, as to the last issue of £10 shares, at 5 per cent., every Shareholder would receive £13 6s. 8d., which would give him, in the future, 6 instead of 5 per cent. He also said there were debentures amounting to £5150 in hand, and these would be transferred to the Council. He considered the transaction would be fair as between the Council and the Company.

CRYSTAL PALACE DISTRICT GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the Albion Tavern, Aldersgate Street, London, on Thursday last—Erasmus Wilson, Esq., F.R.S., in the chair.

The Secretary (Mr. Magnus Ohren) having read the notice convening the meeting, the following report and accounts were submitted to the Proprietors:—

The Directors report that the general working of the Company during the half year has been satisfactory.

The new gasholder will shortly be completed. This gasholder will give the Company an additional storeage of 465,000 cubic feet of gas.

The Directors have a Bill before Parliament to give the Company further powers in relation to stoves for the purposes of cooking and heating, fittings, and other incidental matters.

The Directors going out of office by rotation are Professor Erasmus Wilson and Mr. H. P. Stephenson, who, being eligible, offer themselves for re-election.

The Auditor going out of office by rotation is Mr. Alfred Layton, who, being eligible, offers himself for re-election.

The reports of the Gas Examiners of the parishes supplied by the Company, on the illuminating power of the gas and its freedom from sulphuretted hydrogen and ammonia, continue to be satisfactory.

The Directors recommend that an addition be made to the Secretary's salary of £50 per annum.

The accounts annexed show the financial position of the Company. The balance of profit and loss account amounts to £11,621 18s. 6d. Out of this sum the Directors recommend the declaration of a dividend for the half year ending the 31st of December last at the following rates per annum—viz., 6 per cent. on the preference stock, 7 per cent. on the ordinary 7 per cent. stock, 10 per cent. on the ordinary 10 per cent. stock, and 7 per cent. on the new ordinary 7 cent. shares, all less income-tax. This will absorb £10,452 12s. 1d., and leave £1169 6s. 5d. to be carried forward to the profit of the succeeding half year.

REVENUE ACCOUNT, *for the Half Year ended Dec.* 31, 1878.

Dr.					Cr.			
To Manufacture of gas—					By Sale of gas—			
1. Coals, including all expenses	£21,030	18	4		Michaelmas quarter—			
2. Purifying materials, wages, &c.	916	11	11		1. Private rental—			
3. Salaries of Engineer and Officers	544	14	8		1,830,600 cubic feet, at 3s. 7d.	£327	19	9
4. Wages and gratuities	3,514	12	9		1,499,300 " 3s. 0d.	281	2	5
5. Works, machines, and retorts—Maintenance of, repairs, and labour	3,521	16	4		54,009,900 " 3s. 10d.	10,351	17	11
			£29,528	14 0				£10,961 0 1
Distribution of gas—					2. Public rental and under contracts			1,829 1 10
6. Salaries of Chief Inspector, Inspectors, and Clerks in Light Office	£701	12	11		Christmas quarter—			
7. Mains and service-pipes, repairs, maintenance, renewal, and labour	968	15	7		3. Private rental—			
8. Meters, gas-stoves, and regulators, repairing and renewing, &c.	1,060	8	7		4,896,500 cubic feet, at 3s. 7d.	£877	5	9
			2,730	17 1	132,807,700 " 3s. 9d.	24,901	8	4
Public lamps—								25,778 14 1
9. Lighting and repairing			617	1 5	4. Public rental and under contracts			1,855 9 7
Rents, rates, and taxes—					Gas-rental			£40,424 5 7
10. Rents	£16	4	6		5. Meter-rental—the half year			658 15 0
11. Rates and taxes	1,883	14	11		Total rental			£41,083 0 7
			1,899	19 5	Residual products—			
Management—					6. Coke, less labour and cartage	£7,928	9	1
12. Directors allowances	£750	0	0		7. Breeze " "	254	13	7
13. Salaries of Secretary, Accountant, Clerks, and Messenger	561	13	5		8. Tar	975	11	4
14. Collectors commission	422	3	0		9. Sundries	6	3	9
15. Stationery and printing	216	10	7			£9,164	17	9
16. General establishment charges	372	2	9		10. Sulphate and ammoniacal liquor, less labour, &c.	1,899	7	4
17. Auditors	30	0	0					11,064 5 1
			2,352	9 9	11. Rents			47 12 2
Sundries—								
18. Law and parliamentary charges			250	0 0				
19. Bad debts			224	11 2				
20. Insurance-fund			202	10 6				
21. Horses and carts			424	0 0				
Total expenditure			£38,230	3 4				
Balance carried to profit and loss account			13,964	14 6				
			£52,194	17 10	Total receipts			£52,194 17 10

PROFIT AND LOSS ACCOUNT (Net Revenue).

To				By			
Reserved fund account, amount carried from the half year's profits	£3,500	0	0	Balance of net profit from last account	£11,103	2	11
Balance of net profit to be carried to next account, subject to half year's dividends to the 31st of December	11,621	18	6	Less dividend paid for the half year ended the 30th of June	10,188	16	10
						£914	6 1
				Balance from revenue account, being profit for the half year		13,964	14 6
				Interest on contingent-fund, &c.		242	17 11
	£15,121	18	6			£15,121	18 6

The Chairman, in moving the adoption of the report and accounts, said: Before putting the resolution to you, I will venture to say a few words with regard to our position on the present occasion. The first paragraph of the report assures you that our working has been of a satisfactory character during the half year; and the best evidence that I can give you of that is the last paragraph, which shows that the full amount of dividend will be paid to the Shareholders, after having apportioned a certain sum, as has been our custom, to the reserve-fund, and at the same time carrying over a very handsome surplus to the ensuing half year—as you will see, a surplus of £1169. Our next paragraph relates to a new gasholder, which is about to be completed. It is one of the conditions of a successful gas manufacturing company that they should require from time to time more storeage room for their gas; and I am happy to say that is our present position; or, perhaps, we have rather been anticipating the possibility that more room may be required be us very shortly. It is a necessary condition of discretion and judgment, in connection with gas manufacture, that we should have such ampty storeage room, that we may be enabled to supply the district with greater ease; it also enables us better to carry out a scheme connected with our Company, which we have adhered to for a number of years—that of keeping the Sunday free from workmen's labour. By having large storeage room at hand, we are enabled to strike work at six o'clock on the Sunday morning, and to resume it again at six o'clock in the evening, when the night gang comes on duty; so that the whole of the day is given to the workmen, with the exception of just two or three men, who are upon the ground for the purpose of supplying the furnaces. As you will see, this new gasholder is one of fair size, enabling us to keep under our command no less than 465,000 cubic feet of gas. Our next paragraph relates to a Bill which we thought it desirable to go to Parliament to obtain, and you will observe that the paragraph states that the object of the Bill is to obtain further powers in relation to stoves for the purpose of cooking and heating, and for providing fittings and other incidental matters. It happens curiously that, although our Act of Parliament gives us full powers to manufacture and sell gas, yet legally there is, or there might be some difficulty with regard to our taking up any contrivances connected with the consumption of gas, which are not the immediate results of the process. We have long felt, in our district particularly, that it was a matter of great importance to the consumer that he should be provided with the means of heating, and especially of cooking, by the aid of gas-stoves. The consumers, however, were not always ready to purchase these articles for themselves; but they came down to our office for the purpose of consulting us with regard to this matter. We, therefore, felt that it would be to our interest, and also to theirs, that we should have the means of supplying gas-stoves to the district at a small rental. The subject has been one which has especially interested our Secretary, who has taken a great deal of trouble in regard to it. In fact, he is always entering with great enthusiasm into the wants of the consumers; and, in this particular instance, he believed that he could do them a great service by the introduction of these stoves. As long back as twelve years ago we published, under the name of this Company, but prepared and written by Mr. Ohren, an excellent pamphlet, which was circulated in the district, for the purpose of showing the best kinds of stoves for warming and cooking purposes, and the way in which they were to be managed; explaining various contrivances by which the gas might be utilized with the greatest advantage to the consumer. There is another little instrument—a kind of drawing-room philosophical toy—which is coming greatly into use, and the extent of the utility of which we can scarcely conceive at the present moment. I allude to the gas-engine. These engines are found useful for a very great variety of purposes, and, amongst others, for the production of the electric light. No progress could be made with the electric light without the gas-engine; so that when there was a probability of this philosophical process of obtaining light through the agency of electricity becoming popular, we felt that we, as a gas company, ought to be in a position to supply the machine or the engine which was requisite for the purpose. The light might, at first sight, appear to be somewhat antagonistic to our interests; but it could make no progress without help from us. We did not withhold the kind of help that was necessary, and that we thought desirable, for the carrying out of an experiment which has not yet attained success, but which, in the course of years, may probably do so. We wished to put ourselves in a position, in point of fact, to exercise all those powers which might by any chance come within our reach, not only for the manufacture of gas, but also for its utilization. The electric light has attracted the attention of the public, and somewhat painfully excited the attention of gas shareholders, whose anxieties are now, I hope, calmed and more settled, for we shall undoubtedly have plenty of time before we need be anxious upon that ground. However, since this subject has been brought before the public, there has been associated with it another great question, and that is, whether we consume our gas properly. A friend of mine, connected with a large office the City, one day said to me, as if in triumph, and as a kind of taunt "You are a ga smanufacturer. Look at that ceiling." To which my answer was simply this: "My dear friend, there is sticking to your ceiling, that beautiful greasy gas that ought to have been burnt in your lights. Your mode of combustion is imperfect. You allow a large quantity of your gas to escape unburnt, and it fixes itself upon the ceiling. Now, let me introduce to you a friend of ours, who is a great inventor—Mr. Sugg." Accordingly, Mr. Sugg went, and put up two kinds of lamps, which I was called upon to inspect. They were put up in an office, and I said to one of the clerks there: "Well, how about the light?" He said: "Oh, we have too much light now." I said: "Well, then, it is of no use talking to you about the electric light, if, by putting a proper kind of burner on lamps, you get too much light." It is quite clear that that is the direction we should endeavour to take for the purpose of securing thorough combustion of gas, and using it to its fullest extent. We have been shamefully wasteful up to the present time with regard to the mode in which we have dealt with gas. If we had only employed the proper means, we should have had not only a better light, but a more wholesome one; and we should have been free from the objections which are now levelled against that which has become as much a necessity of our existence as the light of the sun itself. I have only to allude to the improved kind of illumination

which is being applied at the present time, under the direction of Mr. Sugg. No doubt you have all seen the Christiania burner, which gives a most brilliant light with ordinary gas. I shall pass over the next paragraph in the report, simply remarking that you have the names of two gentlemen before you there who have been with us from the beginning. With regard to the next paragraph, it relates to that which, I am quite sure, you will all feel is a very proper consideration in connection with the manufacture of gas—that is to say—urging upon all the officers who are connected with this matter, the utmost vigilance in trying to discover imperfect illumination, or even imperfect chemical composition of the gas. The instructions of the Board have been—and I am sure that the views of the Shareholders have been similar—that we cannot be too strict in our manufacture; and we may boldly say that we produce as good an article as the present appliances of science will enable us to obtain from that most useful and wonderful material, coal. We secure its purity—indeed, we are bound by rather serious obligations to preserve it free from sulphur (although I myself have not the same objections to sulphur that are entertained by the general public)—and we are under a similar obligation to secure the most perfect degree of illumination that can be produced. The next paragraph is one that I know will be acceptable to the Shareholders. For many years they have seen the exertions of their Secretary devoted to their cause, most energetically, most unreservedly, most whole-heartedly; and they have felt that he has been to them a worthy servant, and most deserving of the encouragement which I am sure he will receive at their hands on the present occasion. Gentlemen, I need not do more than refer to the words of the resolution, which I now beg to propose.

Mr. C. Lea Wilson seconded the resolution.

The Chairman said that if the Shareholders had any questions to put with regard to figures, Mr. Stephenson would answer them.

Mr. Bengough asked what was the present salary of the Secretary.

The Chairman: £650, at present.

Mr. Bengough said he should be most pleased to vote for the addition; and he felt quite sure that every one present would also do so.

The resolution was then put, and carried unanimously.

The Deputy-Chairman (Mr. H. P. Stephenson) moved—"That a dividend for the half year ending the 31st of December last be now declared and made payable forthwith, at the following rates per annum:—6 per cent. on the preference stock, 7 per cent. on the ordinary 7 per cent. stock, 10 per cent. on the ordinary 10 per cent. stock, and 7 per cent. on the new ordinary 7 per cent. shares, all less income-tax."

Mr. G. Livesey seconded the motion, and it was unanimously agreed to.

Dr. Anderson moved the re-election of Professor Erasmus Wilson as a Director, considering that it was a great honour to the Company to have such a gentleman as their Chairman.

Mr. Hive seconded the motion, and said that the intellectuality of their Chairman was not the best part of him, although it was of the highest order.

The motion was put and carried.

Mr. Layton proposed the re-election of Mr. H. P. Stephenson as a Director.

Dr. Ogg seconded the proposition, and it was agreed to.

Mr. Stephenson, in thanking the Proprietors for his re-election, said it was 25 years since he first became a Director of the Company, and he hoped that during that time he had served the Shareholders well.

Mr. W. H. Bennett proposed the re-election of Mr. Alfred Layton as an Auditor of the Company.

Mr. F. L. Lingine seconded the proposition, and it was carried.

Mr. Bengough said that everybody was pleased with the dividend, and he thanked the Directors as a body that it had been earned. They would all think it was right that the addition should be made to the Secretary's salary, as he fulfilled his duties most efficiently. Alluding to the electric light, they knew that the Corporation of London had tried it, and that it had failed at Billingsgate Market. The Corporation had done all they could, and had been assisted nobly by the Gas Companies, who had said, "If you will only pay the price, we will give you a first-rate article;" and he thought they had it. The Shareholders were much indebted to the Chairman and the Secretary, and he had great pleasure in moving—"That the salary of the Secretary be increased by the sum of £50 per annum."

The resolution was unanimously agreed to.

The Secretary expressed his thanks to the Directors and Shareholders for the kindness they had shown to him. He was now serving his 24th year with the Company, and if he were a young man, he should hope that he might serve another 24 years.

Dr. Chapman proposed that the thanks of the meeting be given to the Directors for the great care they had exercised in the management of the affairs connected with the Company.

Mr. Pocock seconded the proposition, and, in doing so, said that having recently sold some of the Company's stock at a great sacrifice, he deemed it right to explain that it was simply in his capacity of trustee that he had parted with the property, and that the cause of his doing so was a purely family matter, and had not the remotest connection with the electric light "scare." He had had some experience as to that light with Mr. Faraday and other scientific men, and he thought it would be a very long time before anything would be done with it, and he did not believe that it would ever hurt them.

The resolution was then put, and unanimously agreed to.

The Chairman thanked the Shareholders very heartily for the mark of confidence which they had given to the Directors. They felt a great pride in the Company, and each Director had special qualifications which rendered him most valuable to the undertaking. It had not been noticed that Mr. Pocock had sold shares; but since that gentleman had made his statement, he (the Chairman) had ascertained from the Secretary that they had **not** in consequence of the panic, acquired half a dozen new Shareholders. He had another pleasing duty to perform, and that was to propose the following resolution:—"That the thanks of this meeting be given to the Auditors and Officers of this Company, for the efficient discharge of their duties." Mr. Layton, one of their Auditors who had been re-elected, had already addressed them. Another of their Auditors was very familiar to them, as he was to the whole world—he meant Mr. Glaisher. They had heard the Secretary, and in their Engineer, Mr. Gandon, they possessed as perfect an officer as was to be found in the whole department of gas manufacture. Amongst their clerks they had such diligence, care, and devotion to their duties as were in the highest degree satisfactory to the Directors, and the Directors were most happy to have the pleasure of reporting that to the Shareholders.

Mr. G. Livesey seconded the proposition. He said that while the Directors had their part to perform in promoting the prosperity of the Company, all their efforts would be unavailing unless they were supported by efficient officers.

The motion was put, and carried unanimously.

Mr. Glaisher returned thanks for the kind manner in which the Officers of the Company had been spoken of. He had made many visits to the works, and always found the officers performing their respective duties in a methodical and businesslike way, and he believed that they would continue to do so. The Secretary fulfilled his duties in a faithful and courteous manner, and he felt that the Engineer was the right man in the right place.

Mr. Hyslop proposed, and Mr. Chapman seconded, a vote of thanks to the Chairman, which was carried unanimously.

The Chairman acknowledged the compliment, and the proceedings terminated.

ORIENTAL GAS COMPANY, LIMITED.

An Extraordinary General Meeting of this Company was held on Wednesday, the 19th inst., at the Offices, 29, Great St. Helen's, Bishopsgate Street, London—James Sydney Stopford, Esq., in the chair.

The Secretary (Mr. A. Hersee) read the notice convening the meeting, the object of which was to consider and, if approved, adopt the following resolution:—"That the nominal capital of the Company be increased to the extent of £75,000, by the issue of 15,000 ordinary shares of £5 each, on which the sum of £1 per share shall become payable on the 1st day of May next. The said shares to be offered at par to the existing registered Shareholders, in the proportion (as near as may be) of one share for every four shares now held."

The Chairman said the Shareholders had had before them for some days the proposal about to be submitted, and he hoped they had considered it. He thought the few observations he should make as to the cause which obliged them to make this addition to their capital would be quite satisfactory. They were making some very considerable extensions to their gas-works, which would be brought into profitable use next year; some, in fact, were already finished. These extensions comprised lamps to the number of no less than 1580, the number of their old lamps being 3185, showing an increase of 50 per cent. It required £30,000 to pay for these extensions, which was one reason for their wanting more money; and another reason—which was quite as important—was the state of their debenture debt, which many of the Shareholders had urged them to pay off, or at least reduce. They proposed with this additional capital to pay off, not all, but a great part of their debenture debt, as it fell due. It amounted to £76,500, and fell due year by year in the next five years, and at easy rates. If they had not made this additional capital, the uncalled capital only amounted to £45,000, being 30s. per share unpaid on the present new shares. That would have been quite insufficient security against their debentures, supposing they had any difficulty in putting them out; and this was a great argument for their being in a position to pay them off. They would also then have considerable uncalled capital in case they required to put out any more debentures, but he did not think they would do this for some time to come. The call they decided to make would be confined to £1 on the issue of the new shares. They could not make it less than that amount, for it would have had no marketable value at 10s. All future calls would be made from the present new shares; 30s. per share was still unpaid on them, and must likely in the next two, or certainly three years, all of them would be called up, and, he hoped, earn 9 per cent. like the present capital. [In reply to a Shareholder, the Chairman said it was proposed to call up £1 on the new issue of shares, and no further call would be made till all the liability on the existing new shares had been called up.] After this extension of capital, there might be some question as to whether they did not expect to diminish the dividend. They were, however, in great hope that, after laying out this £30,000, the money earned on it would recoup them for the difference they paid on the debenture interest and the dividend they would have to pay on the capital. This difference was about 4 per cent., which, on £76,000, was about £3000; and they hoped that what they were now laying out on the extensions would produce this or more. That, he thought, was all he had to explain as to the necessity of issuing this additional capital, but he would be happy to hear remarks or answer questions from any Shareholder requiring further information. He then moved the resolution as above.

Mr. White seconded the motion.

Mr. Northover said he should have liked to see the whole of the £45,000 capital at present uncalled, at once called up, so that they might have no responsibility hanging over their heads. He believed other Shareholders would acquiesce in that view. Possibly, however, the Directors might not be able to do that. He now held 200 shares, on which there was 30s. each to pay; and, according to the resolution before them, the existing Shareholders would be entitled to one share for every four they now held. He believed he would be entitled to 100 of the new issue, and he intended to take them; but he thought it might be a "close shave," between the exchanges and the additional capital, as to the future dividend. If it were practicable, he would much rather see the outstanding £45,000 called up at once, believing this course, if it could be adopted, to be much better in all respects. This £15,000 might be called up at intervals, as they thought proper.

Mr. Paton said the Directors had apparently made out a good case for paying off the debenture debt; still, he failed to see the propriety of paying off a debt bearing only 5 per cent., and mixing it with capital paying 9 per cent. He knew they had a good property in Calcutta, and he did not know on what ground the money was required for the extension of the works. He believed they had a few more lamps to light there. Was the money to be spent on new mains, or in extending mains, or in what direction?

Mr. Lovejoy failed to see why the uncalled capital was not called up. If anything further was required beyond that, the Shareholders might be asked to authorize additional capital. He thought it was very essential that they should get rid of one liability before creating another. It was not suggested when the liability which at present existed would be called up, after the £1 per share was paid on the proposed new issue of shares.

The Chairman said the chief subject referred to seemed to be why they should create new shares while they had some calls due on the old ones, and his answer was that they had a large amount of debenture debt, and the holders of that debt looked to the uncalled capital for their security. They must therefore have a sum sufficient to be security for the debenture debt. That was the chief reason for the proposed new capital. They expected to make, next January, a call of 10s. per share on the old shares, and the other £1 would most likely be called up within a year from that time, which would then leave them with only the new issue now proposed of 15,000 shares, with £1 per share paid. He thought they had forgotten the late gas scare; but when they saw their shares fall from £8 to £5, as they did for a week or two, it seemed rather important that they should have a large amount of uncalled capital for their debenture debt. That scare had passed off, he might say. It never affected Calcutta, for they obtained their new contract in the midst of it, and not a single question was asked about the electric light. One speaker had made a remark about their suffering from the exchanges. They had been very heavy sufferers from them already, and yet they had managed to give the Shareholders 9 per cent., although their losses by the exchanges last year were nearly £5000. He really did not think the loss could exceed that; and, as trade seemed to be improving, they hoped the exchange would rise.

A Shareholder: It has been falling. The exchange was 1s. 8d., and is now 1s. 7½d., and it may come down to 1s. 6d.

The Chairman said they hoped not. They would see what the Government were going to do. He thought they must submit at present to the small liability mentioned on the old shares. The Directors thought they were giving the Shareholders a little bonus in offering them the new shares

at par, seeing that they were worth a considerable premium in the market.

Mr. LOVEJOY inquired the proportion of the debenture debt as against the share capital.

The CHAIRMAN said there was no limit to their debenture debt. Their capital was £300,000.

Mr. LOVEJOY said the creation of the proposed shares to pay off the debenture debt seemed quite irregular.

The CHAIRMAN said he did not know of any legal reason why they should not act as they proposed. It had been a great advantage to the Company to have this debenture debt, paying less than 5 per cent. instead of 9 per cent.

Mr. LOVEJOY still held that no new debt should be created to pay off the one existing.

Mr. NORTHOVER pointed out that by calling up the existing uncalled capital, the debenture debt could be at once redeemed, and therefore that the need of new capital by way of security to the debenture-holders did not exist. But perhaps the Board were looking to the future. The cost of the new works was put down at £30,000, and that, he should think, was security in itself. They ought not, he thought, to agree to the point before them unless they were thoroughly convinced on it. If the £45,000 were called up, it would place them in funds at once.

Mr. BADDELEY drew attention to the fact that the Company had procured a new contract for 21 years, under which it was necessary that they should spend £30,000 on extensions. That being so, it would be necessary to obtain, from some source, £30,000. At present they had uncalled capital to the extent of £45,000. If they called up £1 per share of that, there would be left only £15,000 as security for debentures to the amount of £76,000. The advantage of the new shares would be this: They would create 15,000 shares, with £1 paid, giving £15,000; that would release the £45,000 uncalled capital; £30,000 would go to extensions, and £15,000 to pay off the debenture debt.

Mr. HAMMACK held that with a debenture debt of £76,000 it would be most improper to make a call of £45,000 and expend it on new works. If anything should happen, they would have works which, for the moment, would not be of use, and there would not be any security. He thought they might fairly authorize the Directors to do what they suggested. He was entirely in favour of their policy.

Mr. BUTLER said the reason which had induced the Directors to lay before the Shareholders this scheme was that the debenture debt was rather larger than it should be at the present time. They were able to borrow their money at 5 per cent. now; but if they were to act on the suggestion made by several Shareholders to reduce the uncalled capital, leaving for the security of the debenture-holders only the property which was in India, they would not be able to continue that debt at 5 per cent. They would be obliged to pay very much more, even if they were able to renew any of their debentures; and if they should have a considerable amount of debentures falling due at a time of panic, they would be suddenly called upon to pay them off, and, not having the power to do so through the uncalled capital, they might be at once plunged into liquidation. That was a danger staring them in the face if they had not a considerable amount of uncalled capital. They had to expend, on account of the new concession, a sum of £30,000. With that £30,000 of outlay, and £45,000 of uncalled capital, there would be left £15,000 to meet the whole debenture debt, amounting at present to £76,000. The position of the Company would be extremely dangerous if they were not to adopt the course now suggested by the Directors. He agreed that it might not be advisable to clear off the whole of the debenture debt as it fell due, and they did not intend to pay it all off, but they would pay it off as they thought advisable. Their scheme, too, was so arranged that, if possible, they would maintain the dividend as at present, and regulate the debenture debt so as to enable them to do so. As to the liability on the shares proposed to be issued, it would be a merely nominal liability, because, with their debenture debt secured by uncalled capital, the debenture-holders would not be so anxious to obtain their money as they would be if they saw only the property, of which they knew nothing. Therefore, it appeared to him that they were perfectly safe in the measure they had proposed, and he hoped the objections which had been offered by certain of the speakers would be removed when they saw that the dangers they apprehended had no foundation.

Mr. HODSOLL said he could see very clearly that the explanation which the last speaker had given them was a perfectly businesslike one, and he should, therefore, support the resolution.

General RIGBY pointed out that the fact that their shares, on which 9 per cent. dividend was paid, were so low in the market, while those of the Bombay Company, on which only 7 per cent. was paid, stood so well, was attributed to the Oriental Company having so large a debenture debt.

The CHAIRMAN said that the new works at Calcutta were very important and very extensive. They had laid no less than 45 miles of new mains, and they had new scrubbers, new condensers, and new machinery of all sorts, and they did not expect their outlay for extensions would stop at £30,000—indeed, they hoped to have continued calls on them for new extensions. Their progress hitherto had been excellent, and they were giving immense satisfaction in Calcutta, by supplying, as the people there said, the best gas the town had ever had.

The resolution was then put and carried with one dissentient.

A vote of thanks to the Chairman and Directors was then passed, and the proceedings terminated.

DOVER GAS COMPANY.

The Half-Yearly General Meeting of this Company was held on Tuesday, the 4th inst.—W. R. MOWLL, Esq., in the chair.

The SECRETARY (Mr. G. Fielding) having read the notice convening the meeting, the following report of the Directors and statement of accounts were presented:—

The steady increase in the consumption of gas which we have been able to report for so many years past, shows every prospect of continuing, having for the past half year somewhat exceeded the usual rate. The use of gas for cooking and heating purposes is much increasing, and we would recommend all who have an interest in the prosperity of the Company to endeavour to extend this branch of our business as much as possible.

The profit made will enable the declaration of the parliamentary dividend for the half year, the payment of the arrears of dividend for the year 1862, and the carrying to the reserve-fund of £337 10s. 1d., which we accordingly recommend for the adoption of the Proprietors.

The increase in consumption already alluded to is so rapidly overtaking our manufacturing power, that, under the advice of Mr. Kirkham, we have determined to erect another double bed of retorts (which we can do without enlarging the retort-house), and we propose during the coming season to construct the tank for the gasholder, alluded to in our last report, with one lift of the holder. The latter will be so constructed that the second lift may be added at a future time without difficulty.

The Engineer's estimate of the cost of the contemplated new works, which must be charged to capital, is £4339. To meet this, we have 130 of the £10 share created on Dec. 13, 1877, and we recommend you to create at the ensuing meeting 400 further £10 shares, to be used for these and such further developments of the works as the increase of business may render necessary.

The whole of the debentures have been taken up at 4 per cent., effecting a saving to the Company of £100 per annum.

Dr. *Profit and Loss Account, for the Half Year ending Dec. 31, 1878.* Cr.

Coals	£4,806	12	2	Sale of gas, less discount and bad debts	£10,619	19 0
Purifying	139	11	0	Coke, tar, and other residuals	2,344	2 8
Repairs and maintenance of works, meters, mains, &c.	2,627	17	9	Meter and fittings rentals	245	17 8
Wages, &c., gas-making	791	10	11	Profits on gas-fittings	110	1 6
Lamps—providing, lighting, extinguishing, cleaning, and repairing	257	12	8			
Rents, rates, and taxes	565	15	6			
Salaries, Collector's commission, and Directors	878	7	7			
Interest on loans	220	6	2			
Incidental expenses	83	9	11			
Law expenses	51	1	10			
Balance	2,885	15	4			
	£13,311	0	10		£13,311	0 1

Balance-Sheet.

Capital raised	£56,200	0	0	Cost of works, less depreciation	£65,370	12 3
Statutory mortgages	10,000	0	0	Book debts	9,544	9 2
Premiums on new shares	5,494	11	1	Coal, coke, sundry stocks, and plant	3,237	0 10
Balance of profit accounts	4,771	1	10	Invested in £919 13s. 7d. Consols	876	17 3
Deposits from consumers	308	14	9	Debentures	1,000	0 0
Sundry liabilities	1,092	8	8	Bankers	729	12 0
Balance	2,885	15	4			
	£80,752	11	8		£80,752	11 8

The CHAIRMAN said the Directors met the Shareholders that day, as they had done in years past, under circumstances of unalloyed satisfaction. The business of the Company, during the past half year, had been conducted in every respect in the most satisfactory way, and with the most successful results. The consequence of that was that they were in a position to declare the full parliamentary dividend, and to appropriate £337 10s., the balance of their profits after paying that dividend, to their reserve-fund. They would notice that in their report the Directors drew attention to the fact that it was absolutely necessary that they should increase their manufacturing power during the present season. The consumption of gas in this and in most other towns, but, perhaps, more so in Dover than in a great many other places, had, during the last year or two, gone up in the most marvellous way; so that frequently, during the past season, they had been obliged to increase their supply very considerably. Such an increase must necessitate an extension of plant; and when he told them that for some few days during the very cold weather, and during the very short days, their manufacture was put to the utmost stretch, he thought he proved to them that, inasmuch as they were bound to give an efficient supply of gas to everybody who demanded it, and who was willing to pay for it, they must also be in a position to give that supply when it was asked for. Of course, they did not expect next winter that the increase of consumption would be at the same rate that it had been during the past year; but it might be, and therefore it became the more necessary that arrangements should be made in order that they might not be in the unfortunate position of having to reduce the supply of gas just at the period when that supply was most necessary. The estimated cost of the new works mentioned in the report was £4339, towards which they had shares unappropriated amounting to 130 £10 shares, and they recommended to the meeting that 400 additional £10 shares should be created at the present meeting, to be used for these and such further developments of the works as the increase of business might render necessary. He would put the following statistics before the meeting:—In the year 1864 the capital was £43,740, the consumption of gas in that year being 57,174,000 cubic feet. Last year the capital of the Company was £66,200, and the consumption of gas 104,100,000 cubic feet; showing that whilst their capital had only been increased 50 per cent., the production from that capital had increased nearly 100 per cent. Let them bear that in mind. In the majority of gas companies the capital employed varied from 16s. to 18s. per 1000 feet of gas sold, whereas the present capital of that Company per 1000 feet of gas sold was 12s. 9d. He need not point out to them that, although there did not appear to be a great deal of difference between 12s. 9d. and 16s., yet, if they came to multiply that by the figures which had already been given, they would see that the amount of capital represented was a very large sum. Of course they were all expecting to hear something about the electric light, and perhaps some persons might suppose that, as the mouthpiece of the Company, he was going to abuse it. He was going to do nothing of the sort. They all, as inhabitants of Dover, had ample opportunities of seeing what the electric light could do. They had only to look at the South Foreland, or at the Dungeness lights, and they would there see that it was in the power of electricity to produce a light of marvellous brightness and concentration in one particular spot. The province of the electric light was to light large places, and those places where the demand for it was uniform. But let them look at some of the difficulties which the electric light had, in its present stage, to contend against and to overcome, before it could successfully compete with gas. In the first place, it was admitted that the cost incurred in the production of the light was about four times greater than with gas light. The next difficulty was the subdivision of the light—that was, the division of any given current into a number of smaller currents. The loss of power which ensued from such an application of electricity was very great indeed. He thought it had been established that one dynamo-electric machine could only send the electric current something like one-eighth of a mile. Let them take a given district to be supplied—say 20 houses. Now, the machine supplying those houses must be either near the middle of the row, or near to one end; but say it was at the middle. The quantity of the electric fluid which must be continuously passing through the wires from the shades of evening up to daylight next morning must be equal to all the electricity that could possibly be used at all the different lights in those houses—or, reckoning 12 lights to each house, the quantity of electricity must be equal to the supply of 240 lights. Now, what was the experience in lighting by gas? In the early part of the evening they only required a very moderate supply; in the busy time they wanted a full supply; and then, when they had passed over that period, they went back to a graduated supply; until they came to night time, when a few of them only kept a small light in their bed-rooms, and consequently a still smaller supply was required. Now they only paid for what they used; but if they resolved to have the electric light in its present stage, they must be prepared to pay as much as their neighbours although they might only have 2 lights, while their neighbour had 20. That, of itself, would create a considerable prejudice against the electric light, because a man would say he only wanted to pay for what he used. He would give them four or five distinct reasons why lighting by gas retained a great pre-eminence over electricity—(1) its smaller cost; (2) its power of indefinite subdivision; (3) its power of storeage; (4) its power of measurement; and (5) its wonderful facility of application. The matter did not end there. A few years ago it was in the power of the gas companies to say, in the words of Alexander Selkirk, "I am monarch of all I survey; my right there is none to dispute." But now the time had come when electricity had disputed their right. What had it brought

about? It had brought about a most healthy state of things. Gas engineers had begun to rest upon their oars. But the keen intellects to whom they owed it that the manufacture of gas had reached the state of success that it had, were not going to lie down at the appearance of this giant, and give up the position they had so long occupied. And so an eminent gas engineer had brought out a series of burners, which would give, if the public would pay for it, just as intense a light as was produced by electricity. That being so, if, on the one hand, electricians were straining every nerve to bring their pet project to a successful issue, gas engineers, on the other, were straining every nerve to give increased efficiency to their pet project. What would come of all this? It would tend to the public good. He would say, in conclusion, that, supposing the electric light did supersede gas, he was happy to tell them that, so far as Dover was concerned, their dividend was in no danger whatever. A few years ago, if the Corporation had threatened to take their lighting away, the loss would have been one seriously felt. But not so to-day. The total amount of gas consumed by the public lighting was only about one-eleventh of the public consumption. And supposing that to-morrow the Corporation should decide to light the streets of Dover by the electric light, the Company would be in a position that day twelve months to declare the full parliamentary dividend. He knew there would be certain alterations needed in different parts of their working, but still they could see their way perfectly clear to declaring their full parliamentary dividend. He begged to move that the report of the Directors now read be received and adopted.

Mr. BOTTLE seconded the motion.

Mr. BARNETT said he should like to ask how it was that the book debts had accumulated to such an extent. He saw that they amounted to no less than £9544 9s. 2d. There was another item on the other side of the accounts—deposits from consumers, £308 14s. 9d. Was he to understand from that that any of the consumers were at liberty to deposit, and receive a certain percentage on their deposits?

The CHAIRMAN said Mr. Barnett would notice that their balance-sheet showed that they were making up the half year's account to the 31st of December. That was the state of the books on that night. He did not suppose there was any gas company in the kingdom where the debts were more efficiently collected than they were by their Company, and he believed he was right when he said that, at the present moment, the book debts did not exceed £200.

Mr. R. H. JONES (the Manager) said they were between £300 and £400.

The CHAIRMAN said that amount had been reduced within six weeks to between £300 and £400. He thought that was a sufficient proof of the efficient manner in which the debts were looked up and collected. With regard to the other question put by Mr. Barnett; he (the Chairman) might say that strangers came into the town, and asked to have gas laid on. The Company were entitled, under their Act of Parliament, to take a guarantee from them in the shape of a cash deposit for the payment of their gas bills when they became due.

Mr. PHILPOTT said, in speaking of the merits of gas over the electric light, the Chairman might have mentioned that the consumption of gas was increasing very rapidly for cooking and heating purposes. It was a well-known fact that the electric light had no heating properties, and, therefore, they could not anticipate a rival in that particular quarter. But as the public outside generally wanted information on certain points, he would ask a few questions. How many more years had they to make up the back dividends?

Mr. FIELDING said ten years.

Mr. PHILPOTT said he would suggest that when those back dividends were all paid, the balance accruing from the profits should be divided equally between the reserve-fund and the reduction of the price of gas. Then, with regard to the advisability of raising further capital. There was a feeling that it would be better policy to wait a little before extra capital was raised, and he thought the sense of the meeting should be taken upon it. He saw the increased income for the year was £740. That seemed very satisfactory. But he could not understand how it was that there were still £300 in book debts outstanding.

Mr. R. H. JONES said Mr. Philpott must bear in mind that some of the debts were for fittings as well as for gas.

Mr. PHILPOTT said he saw that the incidental expenses amounted to £83 9s. 11d. That seemed a large sum.

Mr. R. H. JONES said that was smaller than usual. Where they had 2000 consumers to deal with, the stationery and stamps amounted to a considerable sum.

The CHAIRMAN said the Directors were at one with Mr. Philpott upon the question of raising extra capital. They did not want to raise capital unnecessarily; but they were not allowed to carry on the business of the Company just as they pleased—they were bound to obey the terms of the Act of Parliament. If they were to attempt to enlarge their works in the way in which it was absolutely necessary, without raising additional capital, they would be transgressing the law, and be liable to an action. There was a certain class of work to be done which could not be done, in five minutes. The erection of this tank for the gasholder would take several months. Let them suppose they did not do this work, and an increased supply was required. What would be the consequence? They must select a certain number of persons in the town, and cut off their gas, because they were bound to keep the public lights supplied. They would not be able to supply all the public lights and the consumers too, and therefore they would have to cut off the supply from their enemies, and only accommodate their friends.

The motion was then put, and carried unanimously.

The CHAIRMAN said the next resolution was—"That a dividend for the half year upon the Company's stock and shares, at the rate of £7 10s. per cent. per annum, be made, and the same is hereby declared; and that the deficiency in the prescribed rate of dividends which accrued in the year 1862 upon the stock and shares then existing, being at the rate of £1 10s. per annum, be now made up and paid."

Mr. STONE seconded the resolution, and it was carried.

The CHAIRMAN said there was another resolution—"That 400 new shares at £10 per share be created, to be used for such further development of the works as the increase of business may render necessary."

Mr. FRY, in seconding the resolution, said every Shareholder in the Company must feel that whatever was done by the Directors was for their joint interests. Last winter the Company were up to the hilt for gas. If that increase went on only to the extent of one-half, and they could not supply the gas, what would the Shareholders think of a board of directors who had not foreseen the necessity when everybody was calling for gas and they could not supply them? After a great deal of consideration, their Engineer told them they must do a certain work. If they had one of the best engineers in the Metropolis—and Mr. Kirkham was one—and he said, "You must do this or that," what would they think of a board of directors who did not do what they were recommended?

Mr. PHILPOTT said his object in making the observations with regard to that subject was that it was doubtful what might take place in the course of twelve months.

The resolution was then put and carried.

Mr. R. H. JONES said before the meeting closed he might say that the Brighton gas shareholders were not at all afraid of the electric light, as the Brighton and Hove Gas Company had a Bill in Parliament to double their capital.

Mr. PHILPOTT proposed a vote of thanks to the Chairman and Directors for their successful management of the affairs of the Company during the past half year.

Mr. BARNETT seconded the motion.

The CHAIRMAN, in returning thanks, said the position which he occupied as their Chairman afforded him a great deal of pleasure, and in the names of his colleagues he could promise the Shareholders that they would continue to devote their very best energies to the successful working of the Company.

The proceedings then terminated.

ROCKHAMPTON (QUEENSLAND) GAS COMPANY.

The Half-Yearly General Meeting of this Company was held on Thursday, Dec. 19, 1878—Mr. JOHN FERGUSON in the chair.

The SECRETARY (Mr. H. Mills) read the following report:—

In presenting their half-yearly report, your Directors have pleasure in assuring the Shareholders of the stability and continued prosperity of the undertaking. Attempts have been made of late to depreciate the value of gas properties, through fear of the electric light; but at several meetings of large companies held lately it has been clearly shown that such fears are groundless, and that very large sums are being laid out upon new works on the present system of gas manufacture. Besides, the Gas Companies Act gives power to the Directors to take advantage of any improvement in lighting that may be discovered.

The balance-sheet shows a nearly similar return to that of the corresponding half year of 1877.

The Directors deem it necessary to write off annually a sufficient sum to cover the depreciation arising from the wear and tear of the works, and this, the Shareholders must expect, will slightly increase as the works progress.

After payment of the usual dividend (at the rate of 10 per cent. per annum) which the Directors recommend, the reserve-fund will amount to £700, and this is expended in extensions and improvements.

During the past year two miles of street-mains have been laid down, large additions have been made to the coal stores; also, a new workshop and office for the Engineer has been erected.

With the present and prospective gas-rentals, the Directors recommend an increase in the discount allowed of 2½ per cent., making 7½ per cent. on ordinary accounts, and 10 per cent. to consumers of over 10,000 feet per month. The rents to be paid before the 15th of each month. Such deductions to commence from Jan. 1, 1879.

Your Directors regret to say that street-lamps have not yet been introduced, but the Company are prepared to make further extensions and liberal concessions whenever this can be done.

It is a matter of surprise and disappointment that after the Company had, at great expense, laid on special services to the Police Offices, the use of gas has been discontinued by this department.

Mr. W. A. Stephen having left the Company's services, no separate Engineer's report is brought before you; but the Directors are prepared to afford any explanation, and are desirous this report should embody all the information that the Shareholders might wish to be furnished with.

Mr. James Hooker has been appointed Engineer; and the Directors believe that the measures taken by them to ensure satisfaction, both to the Shareholders and Consumers, will prove successful.

The usual letter from the Auditors shows the satisfactory state of your accounts, the principal amount due to the Company being the value of goods jettisoned per barque *Rockhampton*, which has not yet been paid.

Dr. *Profit and Loss Account, for the Half Year ending Nov. 30, 1878.* Cr.

Manufacture, distribution of gas, and management	£1,046	7	8	Balance, May 31	£814	18	9
Discounts on gas	106	17	8	Sales of gas, coke, and tar	2,212	2	0
Dividend, June 22	659	14	6	Scrip and transfers	2	9	6
Reserve-fund	155	4	3	Rent of dwelling-house	22	10	0
Wear and tear and depreciation	250	0	0				
Profit this half year	833	16	2				
	£3,052	0	3		£3,052	0	3

Liabilities and Assets.

Capital	£15,000	0	0	Fixed investment	£13,485	8	8
Less due and not called up	1,773	6	0	Floating ditto, coal, coke, and tar	462	3	0
	£13,226	14	0	Sundry debtors	495	0	8
Unclaimed dividends	6	17	6	Due from insurance	355	7	0
Reserve-fund	546	0	3	Cash in hand	6	17	5
A. J. S. Bank	191	8	10				
Profit and loss	833	16	2				
	£14,804	16	9		£14,804	16	9

The CHAIRMAN thought the Shareholders had every reason to feel satisfied with the state of the Company's affairs, as disclosed by the report and balance-sheet. During the past year an extension of 2 miles of mains had been laid at an expense of £950, and 50 tons more were ordered from England, and would be laid as soon as possible after they arrived. The plant was in first-class order. Mr. Stephen, their former Engineer, having left, they had appointed another, Mr. Hooker, who had been an old servant, and he did not think the interests of the Company would suffer in his hands. He moved the adoption of the report.

Mr. J. W. FACE seconded the motion.

Mr. LIVERMORE called attention to the absence of a report from the Engineer, the advisability of which was passed at the last yearly meeting of the Company.

The CHAIRMAN said the Directors did not consider a report necessary, and had not asked the Engineer to give one.

The motion for the adoption of the report was then put and carried unanimously.

Mr. REES R. JONES pointed out that by the 18th clause of the Articles of Association the Directors were entitled to a maximum remuneration of £120 a year; although sitting fortnightly, at one guinea for each member, that sum would not pay for all the sittings, some of which would be done for nothing. He moved that the maximum be fixed at £180.

Mr. J. W. WILSON seconded the motion.

Some discussion ensued and several amendments were made, the result of which was that an amendment, that the maximum be fixed at £175, was carried by 18 votes to 3.

A vote of thanks to the Chairman having been passed, the meeting separated.

METROPOLITAN (MELBOURNE, AUSTRALIA) GAS COMPANY.

The Second Ordinary General Meeting of this Company was held on Tuesday, the 28th of January last, when the following report was presented:—

The Directors submit herewith the accounts of the Company for the half year ended Dec. 31, 1878.

The net amount of profit for the half year is £26,092 10s. 3d.; to which is added the balance carried forward from the previous half year of £2124 18s. 8d.; making a total of £28,217 8s. 11d.; from which is recommended a dividend at the rate of 8 per cent. per annum, amounting to £22,288 8s.; leaving to carry forward £5929 0s. 11d.

Considerable progress has been made during the past half year in adding to and improving the manufacturing plant and other appliances of the Company, whilst the supply of gas in the outlying districts has been much improved by the laying down of larger and additional main-pipes. The services of two duly qualified Superintendents of works have been engaged, and they have now entered on their duties.

Recent improvements in the magneto-electric light have courted public attention, with the result of a general depression in the market value of gas shares, alike in the mother country and in these colonies. That the electric light may be made applicable for the illumination of large halls and open areas is considered probable, but the solution of the problem of splitting it up without loss, and thus applying it for domestic purposes and street lighting, is considered extremely unlikely. In the opinion of electricians of the highest repute, the recently announced American discovery in this direction—the precise nature of which is still kept secret—must have been greatly exaggerated, and we are just informed that a recent trial, in the Billingsgate Market of the City of London, of the Jablochkoff electric candle against gas, resulted in favour of the latter. While, on the one hand, it would be unwise to ignore the influence of competitive illuminating agents—the natural outcome of physical science—it is equally indiscreet to become panic-stricken with every new announcement.

That there is any present reason to fear that coal gas illumination will go out of use, or even suffer decadence, is absurd; indeed, the probabilities are in the contrary direction, to the effect that, although the future wants of society may find a place for these electrical, and, possibly, for other kindred discoveries, gas lighting will continue to subserve the greater part of its old, and many new uses, on a scale, in the aggregate, larger than that it has occupied in the past.

The official Gas Examiner commenced his duties in August last, and has now his testing-room in the Town Hall, Melbourne, fitted up and in good working order. As, however, that gentleman has furnished his report to the Local Authorities interested, which has been already published in part, it is unnecessary at this time further to refer to the subject.

You will be called upon to elect three Directors, *vice* Messrs. George M. Bradshaw, Isaac Hart, and George Wilson, who retire in accordance with the provisions of the 102nd section of the Company's Act, but are eligible for re-election, and offer themselves accordingly. Messrs. W. H. Cropper, Henry Moore, and Richard Twentyman also offer their services as Directors. You are also required to elect one Auditor in the place of Mr. W. H. Barlow, who retires in accordance with the 146th section, and seeks re-election. Dr. Thomas Embling and Mr. A. Galt are also candidates for the auditorship.

Dr.—*Revenue Account, for the Half Year ended Dec.* 31, 1878.

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£47,887 18 4	
Purifying materials and labour, oil, water, and sundries at works	3,062 16 3	
Salaries of Superintendents, &c.	760 13 0	
Wages at works	8,444 18 7	
Repairs and maintenance of works and plant, including renewal of retorts, machines, apparatus, tools, materials, and labour	5,423 7 0	
	£65,579 13 2	
Less old materials sold	4 7 3	
	£65,575 5 11	
Distribution of gas—		
Salaries and wages	1,330 17 6	
Repairs, maintenance, and renewal, including materials and labour, travelling expenses, &c.	1,944 0 9	
Repairing and refixing meters	962 1 3	
Salary of Gas Examiner	83 6 8	
Public lamps—		
Lighting and repairing	2,236 13 4	
Rents, rates, and taxes—		
Rents	302 2 4	
Rates and taxes	574 1 8	
Management—		
Directors allowance	675 0 0	
Salaries of Secretary, Office Manager, Accountant, Cashiers, Clerks, Store-keepers, Office-keepers, and Messengers	2,788 15 3	
Salaries of Collectors	1,430 16 8	
Stationery and printing	431 19 5	
General establishment charges and incidentals	179 17 9	
Subscriptions as per vote of Shareholders	300 0 0	
Law charges	30 9 8	
Bad and doubtful debts	1,893 13 9	
Balance carried to net revenue account	30,078 19 3	
	£110,818 1 2	

Cr.—*Revenue Account.*

By Sale of gas—		
Consumed by meter	£84,040 5 3	
Public lighting and under contract	13,633 17 8	
Residual products—		
Coke, less labour and cartage	9,402 4 9	
Tar	3,574 0 8	
Ammoniacal liquor	137 10 0	
Other products	22 16 10	
Certificate fees	7 6 0	
	£110,818 1 2	

THE ELECTRIC LIGHT ON THE HOLBORN VIADUCT.

The following report, "on the experiment in lighting the Holborn Viaduct by means of electricity," from their Engineer (Lieut.-Col. Wm. Haywood) was presented to the Commissioners of Sewers of the City of London at their meeting on Tuesday, the 4th inst., when it was resolved that the experiment be not continued beyond the three months for which arrangements have been made, expiring on the 9th of March, and that the reference to the Streets Committee of the 14th of January last on the subject of photometrical experiments to determine the relative values of the lights from gas and electricity, be discharged:—

Engineer and Surveyor's Department,
Sewers Office, Guildhall, Feb. 28, 1879.

To the Streets Committee of the Honourable the Commissioners of Sewers of the City of London.

Gentlemen,—In pursuance of your directions to report fully as to the facts relating to this experiment, including the relative cost of lighting the Viaduct by electricity, as compared with gas, I beg to lay before you the following information.

The arrangements were made with the Société Générale d'Électricité for lighting the Viaduct on the "Jablochkoff" system for three months. The works were commenced on the 14th of November, and the lamps first lighted on Saturday, the 14th of December last. They are still lighted nightly.

There are 16 electric lamps in all. 15 are placed at intervals alternately on each side of the street, and one in the centre of the carriage-way at the western end of Newgate Street.

The existing lamp-columns have been utilized, the gas lanterns and fittings have been removed, and replaced by the globes and apparatus containing the "Jablochkoff candles."

The average distance apart of the electric lamps, measured diagonally, is about 110 feet. Each lamp lights an area of about 888 yards superficial of public way.

The electric lamps are lighted from sunset until midnight. The number of public gas-lamps not lighted when the electric lamps are burning, is 86. At midnight, 61 gas-lamps are lighted, 25 lamps remaining unlighted, owing to the electrical apparatus preventing this being done.

The electric current is obtained from two Gramme machines driven by a Robey steam-engine of 20-horse power (nominal), and the entire machinery is contained in a temporary shed erected on vacant land on the western side of Farringdon Street, not far from the Viaduct.

Each conductor consists of seven insulated copper wires. They are arranged in four separate circuits of four lamps each, so placed that the four lamps on each circuit can be lighted or extinguished independently of the other groups.

The conductors are laid in earthenware tubes beneath the public ways; in the subways they are supported on narrow boards spiked to the wall; they are carried up inside the lamp-columns to the globes.

In the bases of the columns are placed the "commutators," for changing the current from one candle to another. Access is given to these by doors in the bases of the columns.

A commutator, for controlling each of the four circuits, is also provided in the engine-shed.

Cost.

To attempt to make an exact comparison of the cost of lighting the Viaduct by gas and by electricity for a period of time, including all seasons, would involve much investigation, as well as assumptions, some of which might be liable to be disputed. I therefore only lay before you the costs you have actually incurred in electric lighting up to the 18th inst., and what would have been the cost of lighting the Viaduct during that time in the usual way by gas. From these facts, I think, the Committee will be enabled to arrive at some practical conclusions as to the relative values of electric and gas lighting.

The Company agreed to provide, fix, and fit up the engine, machinery, conductors, and lamps for £236 8s. 4d. The Commission agreed to provide the foundations for the engine and machinery, the shed and its enclosure, and to do all the work beneath the public ways, the cost of which I estimate at £267.

The Gas Company, on being applied to, at once agreed to deduct the value of the gas not consumed whilst the experiment was being made. This deduction amounted to £50 10s. 10d., up to the 18th inst., and represents the value of the gas that would have been consumed in 61 lamps from sunset to midnight, and 25 lamps from sunset to sunrise.

Considering the responsibilities of the Commission in case of accident occurring from want of light, and the possibility of the electric light failing, I arranged that a lamplighter of the Gas Company should be at hand, from sunset until midnight, when the gas-lamps were lighted. His services were needed on four occasions—viz., on December 19th last, January 10th and 17th, and February 9th of the present year. His wages up to the 18th inst. amount to £18 6s. 3d.

The costs incurred are as follows:—

To the Société Générale d'Electricité for providing the apparatus			£236 8 4
Works executed by the Commission, estimated at			267 0 0
Cost of works			£503 8 4
Lighting from Dec. 16, 1878, to Feb. 18, 1879, 64 nights, at £5 per night	£320 0 0		
Lamplighter's wages	18 6 3		
	£338 6 3		
Deduct saving in gas	£50 10 10		
Proportion of cleaning and lighting, repairs, &c., on 25 lamps (always out)	5 17 4		
		56 8 2	
Cost of lighting for 64 nights			281 18 1
Total cost up to the 18th of February			£785 6 5

The 16 electric lamps are to be lighted from sunset to midnight at a charge of £5 per night. The average time they have been alight during the experiment is about seven hours nightly.

At £5 per night for the 16 lamps, the cost per lamp per hour is 10·7d. Assuming them to have been lighted for the remainder of the night, at the same rate of charge, the cost for the whole would be £10 per night.

A gas-lamp on the Viaduct, including lighting, extinguishing, and cleaning, costs £4 17s. 6d. per annum. It is alight 4300 hours annually, and the cost of each lamp per hour is 0·27d., or but little more than ¼d.

The cost, therefore, of lighting the Viaduct during these winter months by electricity would be 14s. 3½d. per hour, and by gas, 1s. 11½d. per hour, or per night of 14 hours duration, £10 by electricity, and £1 7s. 1½d. by gas.

Applying these rates to a whole year, electric lighting would cost about £3072, and gas lighting £419. Electric lighting, at present charges, is, therefore, about 7⅓ times as dear as gas lighting. It is, of course, probable that, as a permanent arrangement, electricity would cost less than this, while there is reason to believe that no material reduction would be made in the cost of lighting by gas.

If interest be taken on the capital expended in the plant and machinery for the electric light, the cost will be slightly increased.

Illuminating Power.

I have not yet seen an account of the relative illuminating power of the electric light and gas light, which is admitted on all hands to be correct, although it is possible such information may exist. In relation to street lighting, there are other considerations affecting the question, besides that of the intensity of light at given points. I can, therefore, only lay before you some very general statements on the subject, and such assumptions, based thereon, as appear to me to be reasonable, and the results given must be taken as approximate only.

Each electric lamp is said by the Société to be equal to 100 gas-burners, such as are used in the streets of Paris. Those burners, I have reason to think, consume about the same quantity of gas per hour as those in the streets of the City of London. The illuminating power of the London gas is equal to 16 candles (London standard), whilst Paris gas, by the same standard, has a power of 12 candles, or 25 per cent. lower than that of London. If these assumptions be correct, 16 electric lamps should give light equal to that of 1200 of the City gas-lamps; and as there are 86 gas-lamps on the Viaduct, there should be, with uncovered lights, about fourteen times more light given by electricity than gas.

The opalescent globes, which enclose the electric candles, are said to obstruct 60 per cent. of the light. In my previous report* I took 50 per cent. as the reduction, and I had better adhere to that figure here. On this assumption, the 16 electric lights give about seven times more light than the 86 gas-burners.

It must, however, be held in mind that the electric light is given off with great intensity from 16 points only, whilst the gas is given off at 86 points. Thus the feebler light is more uniformly diffused than the stronger. For street purposes, the indivisibility of the electric light, and the diffusibility or quality of the light, are points to be thought of when comparing the value of these two modes of street illumination.

The broad results of the experiment appear, therefore, to be that the electric light on the Viaduct is about 7½ times the cost of gas, and that, subject to conditions under which it is given off, the illuminating power of the electric light is about seven times that of gas.

(Signed) William Haywood, Engineer and Surveyor.

* See Journal for Oct. 29, 1878, Vol. XXXII., p. 643.

THE LIVERPOOL LIGHTING BILL.

In reference to the motion of which Mr. Raikes gave notice last Friday [see our "Parliamentary Intelligence"], the following circular letter has been issued by Mr. Wm. Livesey, the Secretary of the Gas and Water Companies Association :—

"*Electric Light.*

"Dear Sir,—The meeting of this Committee has been deferred until Monday, the 31st inst.

"The Liverpool Lighting Bill has been withdrawn from the Committee, and I have been informed, though it has not yet been officially announced, that it is intended to refer to the Committee instead, the consideration as to whether any and what parliamentary action is required with respect to the electric light, either for Local Authorities or for Gas Companies, and to report their views to the House.

"The Committee will be prepared to hear suggestions from any persons who may offer themselves as witnesses, but will not hear counsel.

"It is probable that the Committee will only sit once or twice a week, and not day by day, as with an ordinary private Bill, and that the inquiry may be extended over the whole session.

"It seems, therefore, that there is no other course for the Companies to take than to proceed with their Bills without the electric light clauses, and rely upon some general measure being passed if it should be found expedient to do so.

"Yours very faithfully,

"*Gas and Water Companies Association,* "Wm. Livesey, Secretary.
6, *Victoria Street, Westminster Abbey, S.W., March* 22, 1879."

LEICESTER CORPORATION GAS SUPPLY.

A Special Meeting of the Leicester Town Council was held on Tuesday, the 18th inst.—the Mayor (Mr. C. Stretton) presiding—when the Gas Committee presented the following report :—

The Gas Committee have to report that the accounts of this undertaking for the last half year, ending the 31st of December, have been submitted to them, from which it appears that the net profits, after paying interest on the mortgage debt, and dividends on the debenture stock, issued as the consideration for the purchase of the concern, is £11,143 9s. 8d. Your Committee have thought it expedient that the amount which was paid as stamp duty on the transfer of the undertaking from the late Company to the Corporation—£246—and the proportion of cost of obtaining the Act of Parliament, which was debited to this account—£350—should be paid out of last half year's profits, notwithstanding that the Act provides that such expenditure might be charged to capital account, and be repaid by instalments. These deductions leave a balance of £8467 9s. 8d., which is chargeable, first, in providing the requisite instalment for sinking-fund to redeem the capital debt; and, secondly, from which a reserve-fund may be established, but which shall never exceed in amount £5000; and the balance is by the Act required to be carried to the district-fund, and applied in relief of the general district-rate.

With regard to the sinking-fund, the Act requires that the Corporation shall from the gas revenues (if sufficient, but if not from the general district-rates) make provision for the extinction of the debenture stock created and issued for the purchase of the undertaking, by sinking-fund, to be created by the payment thereto of such equal yearly or half-yearly sums as, when invested and accumulated at compound interest, will suffice (having regard to the rate of interest of the securities constituting the investments) to extinguish the whole of the debenture stock so issued for the purchase of the undertaking in 60 years. The total amount of stock issued as the purchase-money for the undertaking was £476,651 12s. 6d., and the annual sum required, with interest and compound interest at 4 per cent., accumulating as above provided, will be £2902 16s. 7d. This amount may safely be taken as the annual sum required for sinking-fund on the capital debt, as the Act provides, subsequently to the requirements above recited, that "All sums paid into any sinking-fund by the Corporation shall be, as soon as may be, invested by them in the manner in which trustees are by law for the time being authorized to invest trust moneys, or in any debenture stock, debentures, or annuity certificates issued under the powers of this Act, provided that in the last-mentioned case the securities in or upon which such sinking-fund shall be so invested shall be *ipso facto* cancelled." The Act also provides that the Corporation may at any time, if they think fit, redeem or purchase any portion of the stock at a price not exceeding the capitalized value of the interest on such portion at 25 years purchase, or, in other words, at par; and on giving six months previous notice, in writing, of their intention to do so, to the person entitled thereto, such persons shall be bound to accept the price of such redemption.

Your Committee feel satisfied that the most convenient and simple mode of investing the sinking-fund will be by the extinguishing of stock, and the requirements of the computation, as far as compound interest is concerned, will be fully secured by providing annually, in addition to the sinking-fund, the full amount of interest on the whole original amount of debenture stock, and, as the stock is redeemed and interest thus saved by applying the money so raised, but not required for interest, in further extinguishing stock. This arrangement will not only secure the 4 per cent., which it would be difficult to obtain in any other mode of investment authorized by the Act (as trustees are authorized to invest), but will avoid the responsibility and expense attendant on the building up of a huge sinking-fund. Your Committee may mention that the above calculation as to sinking-fund is made on the basis of an annual investment only. As, however, the investment will probably be made half-yearly, the actual annual amount required will be somewhat less than above stated, but your Committee think it advisable to provide the full sum, in order to leave a small working margin.

With regard to the question as to the application of the balance, your Committee are not unmindful of the fact that a large capital expenditure is being incurred in the erection of new works, which works will require time for developing their earning powers, and, therefore, your Committee have determined to recommend that the sum of £5000, from the last half year's balance, should be appropriated to the establishment of a reserve-fund, and be available for sinking-fund in any less prosperous half year. This, your Committee hope, will be considered a satisfactory precautionary arrangement. Your Committee beg, at the same time, to remind the Council that the establishment of the sinking-fund for redemption of new capital is authorized by the Act to be deferred for a period of five years, which will give some opportunity for development on the expenditure. If the recommendations of your Committee be approved—viz., for sinking-fund, half year, £1002; for reserve-fund, half year, £5000; applied in reduction of district-rate, £2465 9s. 8d.; total, £8467 9s. 8d.—the amount shall be duly transferred before the 25th inst., that being the new date fixed by the Council, and approved by the Local Government Board, for the close of the financial year.

The Committee feel that they ought not to close this report without some reference to the question of the general increase which there was in the last quarter's consumption of gas, and which has previously been referred to in the Council chamber. It has already been explained by circular to every consumer that it had been deemed desirable by the Committee to alter the dates of the meter inspection, and that such alteration would have the effect of increasing the Michaelmas and Christmas accounts; and that, consequently, if there were no increase in consumption, the Lady-day and Midsummer accounts would be proportionately reduced. The anticipations of the Committee, with regard to the first two quarters, have been fully realized; as to whether there will be the proportionate decrease in the two next quarters, will rest entirely with the consumers. Your Committee desire, however, to point out that the whole of the increase was not caused by the above alteration, but is doubtless due mainly to the excessive severity of the weather, offering, as it did, a strong inducement to workpeople in the daytime, and householders both day and night, to freely use gas for heating purposes. In confirmation of the above, your Committee beg to state that the total registration of the consumers meters was in accordance with the make of gas at the works, and are satisfied that their explanation generally will be satisfactory to the Council and the public. They desire, however, to point out that it would be impossible for them to explain individual cases of increased consumption, as there are so many causes over which they have no control.

Mr. Downing moved the adoption of the report. He said it was a matter of congratulation to the Council, and especially to the Gas Committee, that they were able, upon the first occasion, to present such a satisfactory report. Those who were opposed to the transfer of the gas-works, and those who were less sanguine with regard to the purchase, would now realize that, for the present, their fears might be entirely dismissed, and their hopes encouraged that the future of the undertaking would be all that its most sanguine adherents anticipated, and that it would be of advantage to the town and its citizens in future generations. The report showed that they had a net profit on the past six months of £11,143 9s. 8d. Under these circumstances, the Committee thought it desirable that the stamp duty, which might have been charged to the capital account, should be, on such a profitable concern as the gas-works, charged to the revenue. It was right that the preliminary expenses of a prosperous concern should be at once paid off, instead of being added to the huge amount at which the debt at present stood. The stamp duty—£246 15s.—was no small amount. But the parliamentary expenses were only £350, which the Council would consider a very small amount when they considered the magnitude of the undertaking. Deducting these two items, there was left a balance of £8346 14s. 8d. The Committee considered it very desirable to establish a reserve-fund to the full amount stipulated by Act of Parliament—£5000. They were now investing a large amount of capital in new works, and these would necessarily be for some time unremunerative. They had, therefore, deemed it desirable to set apart the full amount of £5000 at once. On the other hand, the provision of a sinking-fund was obligatory. The Act compelled them to invest at 4 per cent. compound interest such a sum as would provide for the extinction of the original debt in 60 years. It was, however, not obligatory that they should only liquidate the whole amount in that time. If, therefore, their profits in the future became so large as to enable them to pay off the amount still more rapidly, then they could appropriate additional sums for that purpose. Deducting the £1002 necessary for the half year's sinking-fund, it left a balance of £2344 14s. 8d., which the Committee proposed to apply to the reduction of the general district-rate. That could not but be regarded as a most satisfactory amount to devote to such a purpose; but he regarded it as only the promise of good things to come. It was to be hoped that the £5000 of a reserve-fund would not be trenched upon by emergencies, and if they were thus fortunate it could only be regarded as a substantial addition to the amount placed at their credit in the general district-rate. He had no doubt, however, in the course of time, as their new works became remunerative, that they would be able to provide still larger amounts towards the reduction of the burdens of the ratepayers. As to the sinking-fund, they would invest the amount in their own debentures, but as it would be inexpedient to build up a huge sinking-fund to be left to accumulate for 60 years until it reached £500,000, they proposed to get rid of the stock, and decrease the amount of the original debt by extinguishing the stock as they went along. Having remarked that it would be very unwise to indulge in any expectation for the present that the price of gas would be lowered on account of the large amount of capital being expended on the new works, he concluded by stating that the undertaking afforded every promise of moving on in the future on prosperous lines.

Mr. Holyland seconded the motion. He said the past half year had been an exceptional one. They had had an extra 14 days consumption of gas added to it; and Messrs. Robinson had informed him that, during the whole of their experience of the works, there had never been so much gas burnt as during the past winter. The prosperity of the past half year was, therefore, unusual, and they must not expect it to continue. They were expending a large sum in the new works—nearly £150,000. It would be at least two years before they would begin to realize any benefit from that expenditure; but, in the meantime, every day during which the amount was borrowed they would be liable for interest. Hence the revenue during the next few years would be liable for interest upon capital which would but gradually become productive. The town, therefore, need not be disappointed, if it did not secure such balances in the immediate future as they had at present. At the same time, the works would progress as well, and even, perhaps, a little better than they might expect.

Mr. Gurden thought, in view of the depression of trade, that the Committee were applying too much of the profits to the reserve-fund and in the reduction of rates, and too little to the relief of the gas consumers.

Alderman Kempson considered the distribution of the profits as proposed by the Committee an admirable one.

Mr. Holmes supported the views of Mr. Gurden in the interests of manufacturers and working men. He hoped the subject would receive consideration, and that the result might speedily be a reduction in the price of gas.

Mr. Green pointed out that they would soon have to pay from £15,000 to £20,000 of interest on the capital required for the new works, and consequently they were not likely to have such a splendid surplus as £11,000 for some time. They were doing wisely in providing the full amount for the reserve-fund.

Mr. Hewitt inquired upon what principle the Committee proposed to buy up their debenture stock. Did they intend to ballot for it, or make it in a certain form compulsory?

Mr. Jessop supported the Committee's recommendations as to the surplus. He did not think it would be right to reduce the price of gas at once; but he had no doubt the time would come when they could safely do so. At the same time, he did not think that the whole of the net surplus should go to the reduction of the rates, contending that at least some of the benefit ought to be conferred upon the consumers.

Mr. Richardson remarked that he advocated the appropriation of the surplus towards the reduction of the price of gas rather than towards the diminution of the rates. As to the quality of the Leicester gas, he held that it was far superior to that which was supplied in other parts of the country. In January last they had had one of the highest rates of consumption of gas that they ever experienced in the borough. But it was due to the excessive inclemency of the weather, the inhabitants using the gas for its heat as well as its light. He did not think they would ever have a half year so exceptional as the last.

Alderman Winterton observed that he should like a reduction in the price of gas, but they were entitled to claim the net surplus for street improvements. The Act stipulated that the net surplus should be devoted to that purpose, and they had plenty of roads and improvements to which they could devote the funds thus obtained, and thus promote the welfare and prosperity of the borough.

Alderman Stafford was not at all satisfied with the quality of the Leicester gas, explaining that at his own residence there was plenty of pressure, but little light.

Mr. Bennett stated that a test at the offices in Millstone Lane had shown the illuminating power to be 16·3 candles, whereas the parliamentary minimum was a little over 13. He thought that by at once contributing the whole amount of the reserve-fund, they would be enabled in subsequent half years to give the advantage more directly to the public.

Mr. Downing, in reply, pointed out that it was in the highest degree desirable that the reserve-fund should be at once provided. They might have an accident any day that would necessitate its expenditure, and if it were not at hand they would find themselves in an awkward predicament. With reference to the mode to be adopted for the extinction of stock, they had not arrived at any decision; but it was a subject that would receive every consideration, and be settled as soon as there were funds to be thus applied. As to the quality of the gas, he had found it in his own house to be pure and good, and he attributed the difference experienced in other districts of Leicester to causes merely local.

The motion was then carried unanimously.

LEICESTER CORPORATION WATER SUPPLY.

At a Special Meeting of the Leicester Town Council, held on Tuesday, the 18th inst.—the MAYOR (Mr. C. Stretton) in the chair—the report of the Water-Works Committee was presented, as follows:—

The Water Committee have to report that the accounts of this undertaking for the last half year ending the 31st of December, have been submitted to them, from which it appears that the net profit, after paying interest on the existing mortgage debt, and dividends on the debenture stock issued as the consideration for the purchase of the concern, is £1454 18s. 3d. The amount which was paid as stamp duty on the transfer of the undertaking from the late Company to the Corporation—£2326—and the proportion of cost of obtaining the Act of Parliament, which has been charged to this account—£350—have, under the authority of the Act, been debited to capital, and will consequently be provided for in sinking-funds, and be repaid by instalments. The above balance of £1451 18s. 3d. is chargeable, first, in providing the requisite instalment for sinking-fund to redeem the capital debt; and secondly, is available for the establishment of a reserve-fund, but which fund shall never exceed in amount £5000; and the balance in any year is by the Act required to be carried to the district-fund, and applied in relief of the general district-rate.

With regard to the sinking-fund, the Act requires that the Corporation shall, from the water revenues (if sufficient, but, if not, from the general district-rate), make provision for the extinction of the debenture stock created and issued for the purchase of the undertaking, by a sinking-fund, to be created by the payment thereto of such equal yearly or half-yearly sums as, when invested and accumulating at compound interest, will suffice (having regard to the rate of interest of the securities constituting the investments) to extinguish the whole of the debenture stock so issued for the purchase of the undertaking in 65 years. The total amount of stock issued as the purchase-money for the undertaking was £402,500, and the annual sum required to extinguish this stock, with interest and compound interest at 4 per cent. accumulated as above provided, will be £1364 11s. 3d. The Water Committee had, at the time of the transfer of the concern to the Corporation, issued 4 per cent. debenture stock to the amount of £49,934, and by the Act it is provided that the holders of such stock may, at any time prior to the 1st of July, 1881, on giving three months previous notice in writing to the Corporation, require them to redeem at par, at the expiration of such three months, all or so much of the water stock as shall be stated in such notice, and on the 1st of July, 1881, every then holder of water stock of the late Water Company shall, in lieu of such stock, become the holder of the same amount of Leicester Corporation gas and water debenture stock, and the water stock shall as from that date be *ipso facto* cancelled. Your Committee, for obvious reasons, have thought it desirable that, in the calculation for sinking-fund, the above should be kept separate from the fund for reducing stock issued to the Shareholders. The annual sum required, with accumulations of interest and compound interest at 4 per cent., to redeem the sum of £49,934, is £169 5s. 9d., making a total annual sum on the whole of the water undertaking of £1533 17s. This amount may safely be taken as the annual sum required for sinking-fund on the capital debt, as the Act provides, subsequently to the requirements above recited, that "All sums paid into any sinking-fund by the Corporation shall be, as soon as may be, invested by them in the manner in which trustees are by law for the time being authorized to invest trust moneys, or in any debenture stock, debentures, or annuity certificates issued under the powers of this Act: Provided that in the last mentioned case the securities in or upon which such sinking-fund shall be so invested shall be *ipso facto* cancelled." The Act also provides that the Corporation may at any time, if they think fit, redeem or purchase any portion of the stock at a price not exceeding the capitalized value of the interest on such portion at 25 years purchase, or, in other words, at par; and on giving six months previous notice, in writing, of their intention so to do, to the person entitled thereto, such person shall be bound to accept the price of such redemption.

Your Committee feel satisfied that the most convenient and simple mode of investing the sinking-fund will be by the extinguishing of stock; and the requirements of the computation, as far as compound interest is concerned, will be fully secured by providing annually, in addition to the sinking-fund, the full amount of interest on the whole original amount of debenture stock; and, as the stock is redeemed and interest thus saved, by applying the money raised, but not required for interest, in further extinguishing stock. This arrangement will not only secure the 4 per cent., which would be difficult to obtain in any other mode of investment authorized by the Act (as trustees are authorized to invest), but will avoid the responsibility and expense attendant on the building up of a huge sinking-fund. Your Committee may mention that the above calculation as to sinking-fund is made on the basis of an annual investment only. As, however, the investment will probably be made half-yearly, the actual annual amount required will be somewhat less than above stated; but your Committee think it advisable to provide the full sum in order to leave a small working margin. Your Committee recommend that the sum of £767, the amount of the half year's sinking-fund, should be set aside for this purpose, and that the balance of the half year's earnings, £687 18s. 3d., should be applied to the establishment of a reserve-fund. If these recommendations be approved, the amount shall be duly transferred before the 25th inst.—that being the new date fixed by the Council, and approved by the Local Government Board, for the close of the financial year. Your Committee may mention that the establishment of the sinking-fund for redemption of new capital is authorized by the Act to be deferred for a period of five years.

Alderman PAGET moved the adoption of the report, remarking that it would be seen the balance for the half year was a very moderate sum. The water-works were in course of development. The present reservoirs would be ample for some years to come, and, if the town went on increasing, they would find that the income would go on increasing in the same proportion, so that, with a very little addition to the capital, there would be considerable increase in the profits. With reference to the net profits which had been made during the half year, the mode in which it was proposed to deal with them was detailed in the report. The Committee had had an interview with Mr. T. Hawksley, whose services were being continued as Consulting Engineer, and they asked about the general condition of the works, and whether he could recommend any particular course of action for their consideration. Mr. Hawksley told them the principal thing they must look to was the economical use of the water, and the avoidance of preventible waste. Mr. Hawksley gave them that caution, because it was a matter of notoriety that when water-works were taken possession of by corporations there was a tendency to laxity in the use of water It was usual, Mr. Hawksley said, to make an allowance of five gallons per head extra under corporation management than it was under private management. In order to prevent waste, they had appointed two plumbing inspectors to see that the work given to the town plumbers was properly done, the chief source of waste being cheap and defective fittings.

Alderman BARFOOT seconded the motion, which was carried.

CUCKFIELD GAS COMPANY.—At a meeting of this Company, held on Tuesday, the 11th inst.—Mr. G. Knott in the chair—the accounts for the past year were approved of, and a dividend of 7 per cent. declared. The retiring Directors were severally re-elected, and Mr. T. Bunting was elected a Director in the place of Sir W. W. Burrell, M.P. Votes of thanks to the Auditor (Mr. R. A. Bevan), who was re-elected for the ensuing year, and to the Chairman, terminated the proceedings.

FATAL GAS EXPLOSION AT LEAMINGTON.—A serious gas explosion occurred at Leamington on the morning of Monday, the 10th inst. Shortly after eight o'clock, Mr. Guy, who keeps a fancy goods shop in the Parade, noticed a smell of gas in one of his bed-rooms, and went to discover the source of the leakage. He was followed by his little girl, a child nine years of age. They entered a room at the back of the house, and had not been there many minutes before an explosion took place, the back of two bed-rooms being blown out into the garden, and Mr. Guy and the girl being carried along with the *débris*. Mr. Guy was cut about the head and face, and partially stunned, and his daughter, in addition to a broken arm and other injuries, had received a severe shock to her nervous system. Medical aid was at once procured, but the poor child gradually sank, and expired shortly before eleven o'clock. Mr. Guy is suffering from his injuries and shock, but his condition is not considered dangerous. The explosion set fire to the premises, but the flames were extinguished before any great additional damage was done. On Monday evening, Mr. W. S. Poole, coroner, opened an inquest on the body of the little girl. The jury having inspected the premises and seen the body, the inquiry was adjourned for a week, when a verdict of "Accidental death" was returned.

THE SOUTH SHIELDS TOWN COUNCIL AND THE GAS COMPANY'S BILL.

A Special Meeting of the South Shields Town Council was held on Monday, the 17th inst.—the MAYOR (Mr. Readhead) presiding—"To receive a report of the Parliamentary Committee on the subject of the South Shields Gas Bill, 1879, and the confirmation or adoption thereof, wholly or in part, and the adoption of such resolution thereon as the Council may see fit." The report stated that since the last meeting of the Council, on the 5th inst., the Parliamentary Committee of the borough of Jarrow and the South Shields Committee had held two joint meetings. The first meeting was on the 10th inst., when the Town Clerk of Jarrow explained, in substance, the views of Jarrow, that they ought to avoid a parliamentary contest, if satisfactory terms could be obtained by a friendly negotiation, and recommended an application to the Gas Company for another interview, when the Joint Committees resolved that a letter, as follows, be written by the Town Clerk of South Shields to Mr. Purvis, Solicitor:—"I am desired by the Parliamentary Committees of South Shields and Jarrow to inform you that they held a meeting to-day, at which, in order to avoid the cost of a parliamentary contest, it was unanimously agreed to propose to the Gas Company that their Bill should be altered so as to make the standard or initial price 3s. 4d., with no increase of dividend until the price charged for gas is below 3s., when the sliding scale for increase of dividend should take effect, and that the discounts suggested by the Committees were 10 per cent. below 100,000 cubic feet consumed, 12½ per cent. below 200,000 cubic feet consumed; 15 per cent. below 300,000 cubic feet consumed; and 20 per cent. below 400,000 cubic feet consumed. Holding these views upon the main question, the Joint Committees request an early interview, with a view to an amicable understanding on the other points stated in the parliamentary report to the Councils of South Shields and Jarrow." At the meeting of the Joint Committees held on the 12th inst., Mr. Strachan attended the Committees, and, at the request of the Town Council of South Shields, explained the effect of the consolidated stock, as stated in the Bill, and some other results of his examination of accounts. Mr. R. Wallis (Chairman), Mr. John Henderson, Mr. Henry Nelson, Mr. J. L. Hall, Mr. R. Purvis (Solicitor), Mr. J. H. Penney (Secretary), and Mr. W. J. Warner (Engineer), attended on behalf of the South Shields Gas Company, and, after considerable discussion, the Company agreed to the following amendments of the Bill—namely, (1) The standard price to be 3s. 3d., with discounts as follows:—7½d. per cent. up to 50,000 cubic feet consumed, 10 per cent. up to 100,000 cubic feet consumed, 15 per cent. up to 200,000 cubic feet consumed, and 20 per cent. above. (2) As to purchase of the Whitburn Gas-Works. The Chairman (Mr. Wallis) stated that it was not intended to ask power to purchase the Whitburn Gas-Works; but only to extend the district into Whitburn parish, up to a line between the colliery and Whitburn. (3) As to capital. It was resolved that the recommendation of the Joint Committees on the subject be waived. (4) Public lighting. The Company refused to make any concession on this part of the Committee's report. (5) Insurance clause (clause 15 of South Shields petition). The Company agreed to strike out clause No. 31 in the Bill. (6) As to testing the purity, &c., of gas. The Company agreed to Nos. 1, 2, 3, 4, 5, and 6, being all the requirements in clause 17 of the South Shields petition. The Company have agreed to clause No. 16 in the South Shields petition. (7) The electric light. The Company refused to agree to the Committee's recommendation on this, although they do not desire any exclusive rights in this respect. (8) As to gas-engines, stoves, &c. The Company offer and undertake to strike out the word "manufacture" in clause 18, in respect of articles objected to. (9) As to powers of purchase by Corporation. The Company refused to agree to this. It was then resolved by the Joint Committees as follows:—"That the terms offered by the Company, as above stated, be acceded to, subject to the approval of the Councils, and the South Shields Town Council be recommended to appoint Mr. Stevenson, M.P., and the Mayor and the Town Council of Jarrow to appoint Aldermen Nixon and Berkley to watch the further progress of the Bill, and that the Town Clerks of the respective boroughs be authorized to withdraw the petitions, upon being satisfied that the Bill is in accordance with the terms agreed upon."

The MAYOR moved that the report be received and adopted.

Mr. DUNCAN seconded the motion, and said he thought the boroughs of South Shields and Jarrow ought to be congratulated on the successful manner in which the arrangements with reference to the Gas Bill had been effected. It was what he anticipated from the first, and he had no hesitation in saying that both the Directors and the Parliamentary Committees had acted wisely in making concessions, thereby saving considerable expense.

After a short discussion, the motion was put and carried, one vote only being recorded against it.

GERMAN CONTINENTAL GAS COMPANY.

The report of the Directors of this extensive organization on their past year's working has been printed, and was submitted to the Proprietors at a general meeting held at Dessau on the 12th of March.

The Directors remark, in their preliminary and explanatory statement, that the hopes which had been entertained of a general revival of trade had not been realized, and there had consequently been a restricted consumption throughout the year. The textile industry alone showed some improvement, but it was balanced by the slackness of other trades. In spite of this and of increased activity in petroleum, the business of the Company had not actually decreased, but had merely suffered a check in its usual progressive increase. In consequence of these drawbacks, the increase last year was the smallest since the commencement of their business, being only 2·33 per cent., against 3·26 per cent. in the previous year, and 3·18 per cent. in 1876. It did not, in fact, represent half the actual increase in former years. In the German establishments there was a positive regress, though only of 0·31 per cent. In the first half year it was really greater—viz., 1·37 per cent.—but was nearly balanced by the effect of the heavier consumption during the second half year. The increase of the three foreign establishments was 7·17 per cent.

Unfortunately, the advantage of this moderate rate of progress was lost through the fall of the rates of exchange on Russia. The peace of last July was followed for a short time by an improvement in the rates; but, from the great quantity of paper money in circulation, there was such a fall as had scarcely occurred during the war, and consequently the loss by exchange on Warsaw was increased. The average rate in 1878 was only 205, instead of 210, as in 1877. The Russian Government would not sanction any rise in the price of gas to compensate for the loss by exchange.

The fall in coal gave hopes of some profit, but this, again, was lost in the case of Warsaw, by the enhanced freight dues levied by the Warsaw-Vienna Railway, and in the cases of the other stations by the low value of coke, which was sometimes sold at a loss. The value of tar also fell, and it was entirely due to the profit fortunately secured by the sale of ammonia, and the good results of the improvements in manufacture continually introduced by the Company's staff, for which the highest acknowledgments are due, that some reparation was made for the other unfortunate circumstances which affected the trade of the past year.

These causes would not, however, have affected the value of stock. It

was reserved for the electric light to shake the trust of many Shareholders in the stability of gas undertakings. In all countries there was a fall in gas shares; some fell 25 per cent., and others 30 per cent. of their usual value. This panic did not arise from the fact of the establishment of electric lighting in the place of gas, for it is only in its infancy; and, therefore, its true value for trade purposes cannot be ascertained. In the whole of the Company's districts only four attempts were made to introduce the new light, and three were relinquished after a short time; so that at present it only exists in one workshop at Gladbach, where a Serrin lamp is in use. The panic referred to merely had its rise in sensational newspaper paragraphs referring to inventions which never came to serious trial or practical use. However, such baseless fears frequently attain greater proportions than can be allayed by sober proofs.

Since the formation of the Company the Directors had followed with the greatest interest every movement in the way of innovation. Even in the summer of 1877, before any of the Shareholders were troubled about it, they had instructed their General Manager to make an examination of the progress of electric lighting in Paris, and the trial was repeated during the Exhibition of last year. The result of these trials, which were most carefully conducted, and communicated to the Shareholders through the newspapers, &c., showed that its costliness entirely prevented its ever being applied for commercial purposes. If even the expense of the electric light could be approximated to that of gas, the latter would still be preferred on account of its convenience. The electric light could only be used in large establishments, and as the Company had only about 5 per cent. of their total lighting in such places, even if they should adopt the electric light, which was, however, hardly probable, it would scarcely affect the usual rate of increase of the Company's business, and would not at all decrease their usual dividend, but, at most, cause a less frequent issue of fresh capital.

At last the Directors are able to state with great satisfaction that the danger to gas interests from the competition of the electric light is at an end. They are corroborated in this statement by the first authorities in electric science—men of European celebrity, whose utterances have not a little contributed to the recovery in the value of the Company's stock. If some Shareholders had but heeded the Directors advice, they would not have sold their shares and lost their money.

To turn from electric lighting to the petroleum competition. The high price of this lighting material in 1876 has been followed by a considerable fall, and the present long period of cheapness must, of course, be a source of loss to the Company. But the low price of petroleum was not the cause of the loss of so many of the Company's customers, so much as the bad times, and it is hoped those who had left them would return in the event of an improvement in trade.

Besides these exterior influences, a further source of disturbance has been the action of the German Government. The ever-increasing necessity of augmenting the Imperial revenue by indirect taxation has caused the intended petroleum taxation to be followed up by a taxation on illuminating gas. The Company, together with the persons interested in German coal-mining, have protested against this proposal, and in it they hope to succeed.

Another blow threatened the Company from the Russian Government, who propose to augment the duties on Prussian and Austrian coals by nearly one-fifth. The Company have, in conjunction with the coal-mining interest, sent a protest direct to the office of the Imperial Chancellor, and have also forwarded a second petition to the Russian Finance Minister, respecting the remission of the present coal dues, and the Directors are glad to state that they are supported in that action by the German Ambassador.

The benefit-fund continues to be useful. The total expenditure from this fund during the year was £586 0s. 7d., or an increase of £36 9s. 1d. over 1877. The workmen's subscriptions only amounted to £202 14s. 8d., the balance being paid by the Company.

The meter manufactory was checked in its operations by the dulness of trade; 769 new meters were made, and 343 were changed and repaired. These numbers are respectively 69 higher and 263 lower than in 1877. The manufacture of brass tubes and fittings, &c., was, however, considerably extended, and the cost of management reduced; so that this branch still returned a profit of 7·66 per cent., or 3⅝ per cent. less than last year.

There were no accidents during the year, and the fire insurance fund was not drawn upon. The annual premium set aside for this fund only amounts to one-fifth of the sum that was formerly paid to the insurance companies.

The Chief Engineer, Mr. O. Möhr, has made a tour in America, and has submitted some highly interesting observations on the construction and management of gas-works in that part of the world.

The distribution of the gas consumption throughout the Company's system was as follows:—

	Cubic Feet.		Per Cent.
Public lamps (streets)	90,777,000	=	13·78
Public buildings	60,314,800	=	9·15
Private consumers	309,209,900	=	46·92
Manufactories	198,698,500	=	30·15
Total	659,000,200	=	100·00

There has been an increase in all the above categories over last year, as follows:—

Street lighting	3,705,000 cubic feet.
Public buildings	1,588,500 ,,
Private consumers	8,663,500 ,,
Manufactories	2,896,900 ,,

There was a decrease in the cases of railways, cotton, sugar, and tobacco factories. The greatest increase was in iron and steel works, of 4,698,900 cubic feet; wool mills increased 1,826,900 cubic feet; and gas-engines, 1,189,000 cubic feet.

The progress of consumption in dwelling-houses was very satisfactory, especially as it is in this department that petroleum is in keenest competition with gas. The increase here was 8,668,500 cubic feet.

The following are the results of the present as compared with the past year's working of the stations. The complaints of bad times are common to all:—

		Production. Cubic Feet.		Number of Lights.
1. Frankfort-on-the-Oder	1877	46,447,700	..	14,648
Do. do.	1878	46,964,100	..	14,969
Increase		516,400	Inc.	321
2. Mullheim-on-the-Ruhr	1877	32,110,200	..	11,221
Do. do.	1878	30,624,100	..	11,411
Decrease		1,486,100	Inc.	190

This station has now been losing ground for three years; the cause being slackness in the iron and coal trades, and competition of petroleum. No improvement is yet apparent.

		Production.		Lights.
3. Potsdam-Neuendorf	1877	56,092,600	..	16,778
Do. do.	1878	55,222,400	..	17,347
Decrease		870,200	Inc.	569

Excepting the past year and 1870, when the use of gas was greatly diminished in the military establishments, the Potsdam station has had no retrogression since its first establishment.

		Production.		Lights.
4. Dessau	1877	22,644,500	..	10,403
Do.	1878	22,758,700	..	10,650
Increase		114,150	Inc.	247
5. Luckenwalde	1877	8,111,000	..	3,579
Do.	1878	8,886,300	..	3,545
Increase		775,300	Dec.	34

Increased activity in the cloth manufactories caused this slight improvement, in spite of the low price of petroleum.

		Production.		Lights.
6. Gladbach-Reydt-Odenkirche	1877	94,398,700	..	29,612
Do. do. do.	1878	93,393,200	..	30,836
Decrease		1,005,500	Inc.	1,224
7. Hagen-Herdecke	1877	35,870,000	..	11,675
Do. do.	1878	36,465,200	..	11,794
Increase		575,200	Inc.	119
8. Warsaw-Praga	1877	223,614,300	..	48,742
Do. do.	1878	242,157,600	..	53,142
Increase		18,543,300	Inc.	4,405

This is the greatest increase that has occurred, with the sole exception of 1875, and is in the private consumption only. Warsaw, the largest station of the Company, has during the past year been fitted with gas-generator furnaces, with the best results; the old settings of six retorts having been replaced by settings of eight retorts. A new retort-house, to contain 26 settings, is in course of erection here.

		Production.		Lights.
9. Erfurt	1877	44,062,000	..	12,008
Do.	1878	41,157,700	..	12,671
Decrease		2,924,300	Inc.	663
10. Krakau-Podgorze	1877	23,199,700	..	6,275
Do. do.	1878	23,823,900	..	6,578
Increase		624,200	Inc.	273

The taxes at this place absorbed one-fourth of the gross profits.

		Production.		Lights.
11. Nordhausen	1877	20,840,700	..	8,115
Do.	1878	21,546,300	..	8,376
Increase		705,600	Inc.	261
12. Lemberg	1877	33,842,400	..	10,463
Do.	1878	34,763,600	..	10,480
Increase		921,240	Inc.	17

The charge of poisoning by gas, which was brought against the Company here, was decided in their favour on the 2nd inst.

		Production.		Lights.
13. Gotha	1877	21,393,100	..	8,143
Do.	1878	21,360,302	..	8,453
Decrease		32,800	Inc.	314
14. Ruhrort	1877	16,578,700	..	4,241
Do.	1878	16,297,500	..	4,327
Decrease		281,200	Inc.	86
15. Eupen	1877	8,474,500	..	4,087
Do.	1878	8,686,600	..	4,107
Increase		212,100	Inc.	20
16. Herbesthal	1877	3,374,700	..	246
Do.	1878	3,350,700	..	246
Decrease		24,000	..	—

The total of all stations was—

	Production.		Lights.
In 1877	691,095,700	..	200,236
In 1878	707,228,100	..	208,911
Increase	16,132,400	Inc.	8,675

The percentage of increase in production and number of lights has been as follows:—

	Production.		Lights.
In 1876	3·18	..	5·41
In 1877	3·26	..	4·50
In 1878	2·33	..	4·33

The average consumption of each light for the year was 3233 cubic feet, or 56·5 cubic feet less than in 1877. In street-lamps the consumption was 11,073 cubic feet for each burner for the year.

The following descriptions of coal were used:—

	Hectolitres.		Per Cent.
Westphalian	345,475	or	40·52
Upper Silesian	276,474	,,	32·43
English	104,849	,,	12·30
Mährish	88,004	,,	10·32
Lower Silesian	37,686	,,	4·42
Various	96	,,	0·01
Total	852,584	or	100·00

The increase over 1877 was 24,810 hectolitres. There was a decrease in the quantity of English and Lower Silesian coals, and an increase in the

other kinds. The average yield of gas was 23·5 cubic mètres per hectolitre = 1824 cubic feet, which was 0·2 cubic mètre less than in 1877.

Trade was very slack in coke and tar, but very good in ammonia, the extra profit on which compensated for the loss by the coke and tar. The production for 1879 is already sold.

There were 168 clay retorts renewed; and the highest production per retort per day was 7582 cubic feet. Gas-generator furnaces were inuse for 48·5 per cent. of the total quantity of coal carbonized, and owing to this system the amount of fuel used was less than in 1877, being 19·79 lbs. of coke per 100 lbs. of coal carbonized. The Company are proceeding with the extension of the generator system, and exact accounts will be kept of the working results thereof, so that detailed information will be accumulated as to the saving, if any, effected in fuel, labour, and maintenance, as compared with the old system.

The total building expenditure on all the stations amounted to £8054 8s. 7d.

The total length of mains was 526,722 mètres, or 20,956 mètres more than the year before.

Dr.—*Working Account, for the Year ending Dec.* 31, 1878.

To Coal account—852,284 hectolitres			£60,800 0 9
Wages account—manufacture of gas			9,457 4 0
Fuel ditto			13,293 9 2
Machinery account—expenses of steam power, &c.			502 7 7
Maintenance and depreciation of plant and tools, trade expenses, &c.			2,788 2 9
Furniture account			261 3 10
Repair and renewal of retorts and furnaces			2,665 13 11
Repair and maintenance of buildings and apparatus, renewal and alteration of mains, road repairs, &c.			3,656 18 8
Cleaning account			235 15 6
Wages of Lamplighters and Inspectors			3,114 9 7
Public lighting account—depreciation and repairs of lamps, &c.			944 6 2
Public oil lighting—losses			23 2 0
Interest account			111 14 2
Salaries account—			
Engineers and Managers	£5,130 13 9		
Accountants and Book-keepers	1,962 4 1		
Wages	794 19 4		
		7,887 17 2	
General establishment expenses			8,751 17 4
Benefit club			192 7 9
Gas-fittings—doubtful debts			125 18 0
Gas-rentals ditto			180 5 11
Blochmann's mortgage, instalment for 1879			102 10 0
Directorial Haupt-Casse at Dessau—balance, profit			103,069 6 3
			£218,164 10 6

Cr.—*Working Account.*

By Sale of gas—			
Public lights	£16,990 10 7		
Private consumers	143,255 7 1		
		£160,245 17 8	
Coke			40,560 1 7
Tar			7,113 1 8
Ammonia—profit on manufacture and sales of liquor			4,667 8 6
Fittings and stores—profit on sales, after deducting all costs and charges			5,311 3 6
Rentals of fittings, &c., on hire, after deducting 7½ to 8½ depreciation			266 17 7
			£218,164 10 6

Dr.—*General Balance-Sheet.*

To Cash in hand			£2,705 1 7
Bills ditto			533 3 1
Furniture, photometric instruments, &c.			1,776 12 2
Fittings on lease, rents due, &c.			4,630 17 3
Ditto, value deducting depreciation			3,765 12 0
Interest on advances			915 0 8
Public lighting—value of plant and materials			169 5 8
Manufacturing account—value of plant and materials used in gas-making			1,457 3 2
Cartage account—value of horses and carts			562 7 8
Cleaning account—value of materials, &c.			34 8 9
Steam power account—stock of lubricants and duplicates, &c.			72 10 2
Retorts and fire-goods in stock			1,745 0 8
Stores and workshop account—			
Tools, forges, &c.	£1,361 13 5		
Mains, meters, &c.	10,560 5 0		
		11,921 18 5	
Gas-making account—			
Unpaid private accounts	£12,496 5 1		
Stock in gasholders	157 4 9		
		12,653 9 10	
Coal in stock at stations—207,738 hectolitres			17,730 1 1
Coke account—stock and credit sales			3,815 7 4
Tar account—stock, utensils, &c., and credit sales			4,499 19 0
Ammonia account—stock and credit sales			1,370 12 4
Public oil lighting—stock			33 19 5
Buildings, gross value			808,133 11 3
General expenses, sundry payments in advance			112 18 7
Oil lighting, unpaid accounts			30 3 6
Blochmann's mortgage, deducting instalment for 1878			2,423 1 3
Sundry debtors			2,394 3 6
			£883,691 8 4

Cr.—*General Balance-Sheet.*

By Credit accounts—			
Instalments on various purchases of land	£2,858 14 9		
Due to sundry creditors	925 2 10		
		£3,783 17 7	
Account of the Directorial Haupt-Casse at Dessau—			
Expenditure of the Central Board on the establishments — balance on Dec. 31, 1878 (*vide* capital account)	£776,838 4 6		
Balance, as per working account	103,069 6 3		
		879,907 10 9	
			£883,691 8 4

Dr.—*Profit and Loss Account.*

To Building account—depreciation			£150 0 0
Furniture—depreciation			39 10 7
Laboratory and instruments—depreciation			11 10 9
Salaries, pensions, and remunerations			3,645 13 7
Interest account, exchanges, &c.			1,388 16 1
Bankers commission, &c.			589 13 9
Charges of benefit society			393 12 10
General establishment expenses			1,111 17 6
Balance, net profit			96,265 3 3
			£103,595 18 4

Cr.—*Profit and Loss Account.*

By Balance brought forward from 1877			£217 3 10
Working balance of meter-shop			309 8 3
Profit of the sixteen stations for 1878			103,069 6 3
			£103,595 18 4

Dr.—*Capital Account.*

To Cash			£7,493 12 4
Bills of exchange			4,655 18 8
Account current, ledger A, Bankers advances			6,518 19 5
Account current, ledger B, advances to Contractors			192 13 8
Directorial buildings			7,382 1 0
Furniture of head office			355 15 0
Photometrical instruments, chemical apparatus, &c.			231 15 6
Meter manufactory			4,053 18 2
Securities deposited in five towns			1,267 10 8
Building and trade capital of stations on Dec. 31, 1878—			
1. Frankfort-on-the-Oder	£49,435 15 8		
2. Mullheim-on-the-Ruhr	39,840 2 1		
3. Potsdam-Neuendorf	65,647 4 7		
4. Dessau	34,371 0 1		
5. Luckenwalde	17,730 7 1		
6. Gladbach-Reydt-Odenkirche	86,793 7 4		
7. Hagen-Herdecke	45,855 14 9		
8. Warschau-Praga	199,555 6 2		
9. Erfurt	37,783 15 0		
10. Krakau-Podgorze	36,297 11 0		
11. Nordhausen	23,072 9 2		
12. Lemberg	51,790 15 11		
13. Gotha	36,988 8 8		
14. Ruhrort	28,629 14 6		
15. Eupen	19,081 19 4		
16. Herbesthal	4,025 13 2		
	£776,838 4 6		
Profit balances of these stations	103,069 6 3		
		879,907 10 9	
			£912,059 13 2

Cr.—*Capital Account.*

By Share capital—			
50,000 shares at £15 (300 marks)		£750,000 0 0	
Deduct unpaid 113 shares at £15	£1,695 0 0		
Ditto 4887 ditto £9	43,983 0 0		
		45,678 0 0	
			£704,322 0 0
Unclaimed dividends, 1876-77			130 14 0
V. Stangen's mortgage			645 0 0
Interest			56 0 2
Agio account, profit on the 1878 issue, 20 per cent. on 4887 shares		£14,661 0 0	
Less applied according to statute		8,488 4 2	
			6,172 15 10
Reserve-fund to last year		£67,500 0 0	
Addition for 1878		3,750 0 0	
			71,250 0 0
Coqui's bequest			165 7 6
Sinking-fund for four stations—			
Amount last year		£25,187 18 1	
Addition for 1878		3,013 8 2	
			28,201 6 3
Fire insurance account—			
Amount last year		£4,355 10 6	
Addition for 1878		244 0 3	
			4,599 10 9
Capital of benefit society			251 15 4
Profit and loss account			96,265 3 4
			912,059 13 2

Distribution of Profit Balance.

Balance, as per profit and loss account			£96,265 3 3
Less Directors allowance			4,802 7 3
			£91,462 16 0
Dividend on 45,000 shares, at £1 19s.	£87,750 0 0		
Interest on 4889 shares, at 3s. 7½d.	879 13 2		
		88,629 13 2	
Balance to carry forward			£2,833 2 10

SOUTH-WEST OF ENGLAND AND DISTRICT ASSOCIATION OF GAS MANAGERS.

The Half-Yearly Meeting of the Members of this Association was held at Weymouth, on Tuesday, the 11th inst., when the President (Mr. Thomas Hardick, of Salisbury) delivered the following Inaugural Address:—

Gentlemen, — You have had the pleasure of listening to so many inaugural addresses, that you will be prepared with thankfulness to forego anything like categorical or copious reference to the various subjects of interest which have recently occurred—subjects akin to those usually introduced on occasions like the present—and which might suitably be commented upon by one more competent than I am for the task. I am not quite sure, though, if time is not occasionally thus occupied which, if given to the subjects assigned for discussion, would not interest and instruct the members more than the most elaborate and carefully-written address. Besides, the admirable manner in which our Journal fishes out and brings to light well-nigh everything of practical value to us in our special profession, makes it almost unnecessary to re-direct attention to that which should be already well known.

It is now 25 years since I first endeavoured to get such a Society formed as the one we now attend, and I wrote to about 30 secretaries and managers of gas companies, only two of whom signified their readiness to help forward such a scheme. Indeed, almost every manager seemed as though he possessed a secret which it would be to his disadvantage to disclose. Happily that day has passed away, and we now meet to see how far we can help each other in carrying on the work of our profession in a satisfactory and profitable manner.

We must not be discouraged by the smallness of our beginning. Remember, the British Association of Gas Managers began in 1863 with only 24 present, and at the first annual meeting in 1864 but 38 constituted the society; yet at the last annual meeting there were not less than 666 members. The report of that society has likewise increased, from a pamphlet of 20 pages, to a respectable sized volume—an ornament to any library, and a valuable book of reference to the student.

It seems rather late to refer to the subject which has been causing so much anxiety to those who have invested their capital in works for the production of gas as a light-giving agent, and I fear that some few timid gas managers have also been led to tremble lest the next telegram from the Western world should render entirely useless the valuable information they have acquired on the interesting subject of gas manufacture.

One problem of great interest has been worked out relating to public lighting by gas, in the adaptation of the lamps to the Argand burner, enabling the very best kind of burners to be used with safety; and experience has shown that very few of the chimneys for these burners break by any wavering of the flame during even the highest wind. If only the public lamp question can be so adjusted as to prevent the everlasting quarrels between the local authorities and the gas companies, it will greatly contribute to a continuance of our prosperity, and to an increase of our peace.

Gas companies have been charged by their opponents—who, by the way, show a reckless disregard to truth—with paying an "exorbitant amount of interest" on their capital, which capital these same opponents nevertheless speak of as "precariously invested"—a judgment concerning our capital which should, in future, reverse their condemnation of our so-called "exorbitant interest" into a justification. This charge, however, has been utterly refuted, and gas companies are not by any means proved to be such rapacious monsters as their traducers have fruitlessly endeavoured to show.

Many eminent geologists, and other scientific men, have often endeavoured to indicate the probable time when our coal-fields will become exhausted, and they have more than hinted that a more economical use of coal is desirable. One would almost think that some of our great electricians have so far sympathized with the alarmists as to endeavour to take a long stride in the direction of discovery, and so to quiet the agitation of the present, and provide for the contingencies of the future, ere it be too late. At present, the position of affairs shows that the electricians and their followers have executed that difficult strategic movement—they have advanced two paces to the rear; and now, instead of being ahead of, or on a level with gas companies in public estimation, they are certainly behind. However, we must not flatter ourselves that the progress of scientific discovery is to be stopped by the present failures, as many of the present difficulties in the way of an easy utilization of electricity for lighting purposes may be overcome. But may not the practised scientist aid the coal gas manufacturer, and, together, may they not effect such improvement in the quality and utilization of coal gas, that it will always be a successful competitor with electricity?

I regret that a part of the periodical press has teemed with the most absurd statements with regard to this subject; they have appeared also to view with ecstatic delight the ruin in which tens of thousands of families must be involved, if any sudden transference of labour and capital were to take place. But never did the writers of such effusions appear to greater disadvantage concerning their knowledge of the ordinary facts of natural philosophy, and also as to the manner in which they were arrived at, than they have done in broaching such a subject as this.

In reviewing the progress of the past 50 years, what do we find has been accomplished? Not, I presume, the discovery of many new principles, but a larger utilization of those previously known; and this has been done to a very considerable extent. The wise man says, "There is nothing new under the sun;" and in nothing is this more conspicuously shown than in the number of repeating patents relating to projects for gas-making. For example, in the year 1851 the Warminster Gas Company were engaged in a lawsuit with Mr. White, of Manchester, in consequence of his entire failure to establish his patent process for making "hydrocarbon gas;" since which time, patent after patent has appeared, only to disappear, in a terminating series of dissolving views. Perhaps the tender of a deferential caution to some of our younger members may not be altogether needless, to be on their guard lest they, like many other unfortunates, should become sorrowfully entangled in a mesh of patents.

I am exceedingly anxious not to absorb your time in what must, under any circumstances, be but a simple introduction to the business of the meeting. I have also a strong desire that, after we have disposed of the subjects to be brought forward, we should have a little time left for free conversation on any matters of interest, without the rigid formalities of a discussion. Before I sit down, however, I must entreat your forbearance toward myself during my tenure of the honourable position your kindness has placed me in. I am conscious that the duties devolving on me, as President of our Society, will, at best, be very imperfectly performed. And I may venture to express my regret that a more efficient member of our body was not selected to occupy the inaugural chair of a society destined, I hope, to grow and shine. Let me impress upon you the importance of keeping the younger blood in circulation.

The circular convening this meeting stated the two principal subjects to be brought before you, and I have no doubt you have all come, more or less, prepared to offer some remarks as to your own experience. May I ask you to be as concise as may be convenient, so that every one present may have an opportunity of speaking, and all, I trust, retire from this meeting the wiser and the better?

The process of purification which is to be discussed, is one of immense importance, and it remains to be seen how far we have advanced in the simple principles of this branch of our operations, beyond the starting-point of lime and water—I do not mean in the economics of manufacture, but in the quality of the article produced.

On the motion of Mr. CROWE, of Wellington, Somerset, seconded by Mr. DURKIN, of Southampton, it was resolved—"That the thanks of the meeting be given to the President for his Address, and that the same be printed."

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

The demand for all classes of fuel, except a little inquiry which is still kept up for the better sorts of house coal, continues extremely dull, and, to avoid stocks going down on the pit banks, work is being stopped at many of the pits for a day or so a week. Generally, however, the colliery sidings are filled with loaded waggons, and in some cases the common mines are being stopped altogether for the present. Very low prices are now ruling in the market, for, although there is nominally no alteration in the quotations, generally colliery proprietors give way slightly to secure orders. There are still but few inquiries for gas coal in the market, and the opinion seems to be entertained amongst buyers of this class of fuel that contracts will be placed at prices quite as low as, if not lower than last summer; and certainly some of the quotations, although probably they may be exceptional, which I have recently heard, seem to justify the anticipation. Common round coal, for steam and forge purposes, is still a drug. Engine classes of fuel, although there is a prospect of their being less plentiful during the summer, are still being pushed in the market, and common sorts especially are offered at extremely low figures. The average prices at the pit mouth are about as under:—Best Wigan Arley, for house-fire purposes, 9s. to 9s. 6d. per ton, with common sorts ranging from 6s. 6d. per ton upwards; Pemberton four-feet, 6s. 9d. to 7s. 6d.; common round coal, 4s. 9d. to 5s. 6d.; burgy, 3s. 9d. to 4s. 6d.; good slack, 2s. 6d. to 3s. 6d. per ton; with common sorts at almost any price.

In the Oldham district, where reductions of 10d. per ton all round have just been made, the men have received notice of a reduction in wages to the extent of 2d. in the shilling.

There is no material change to notice in the iron trade, the amount of business in either pig or manufactured iron being still only small, and prices are the same as last week, except that north country makers in some cases are not quite so firm in holding out for the full advance when orders for immediate delivery are to be obtained.

Contracts for foundry work continue to be taken at very low figures, and one for lined water-pipes has just been concluded by the Heywood Local Board, at the following prices:—12-inch and 10-inch pipes, at £4 12s. 6d. per ton; 8-inch, £4 15s.; and 6-inch pipes, £4 12s. 6d. per ton. The whole quantity being only about 500 tons.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The coal trade of the North of England is a little disturbed. The Durham coalowners gave their men notice, about a fortnight ago, of a reduction of wages all round. The representatives of the men have held several meetings, and have also had communications from the masters. Still the men desire that all the matters in dispute shall be referred to open arbitration, the masters refusing to consider the question from that point. Of course, without some general arrangement is arrived at before the notices expire, there will be a strike. In all probability, however, if it were coming to that, it would not last long. But at this season, when the shipping business of the year is opening, it would be extremely awkward. Coasting steamers engaged in the gas coal trade were kept behind last week, through fogs which prevailed in the North Sea. The shipments, however, were not much below an average. The notices for a reduction of wages in Durham terminate on the 5th of April. Independently of this movement, the owners of Pensher and North Biddall Collieries have served their men with notice to terminate their engagements on Friday next. These pits work second-class gas, steam, and manufacturing coal. It is probable that they will be closed for the present. What briskness there is in the gas coal trade is limited to some four or five of the best collieries.

Coasting freights improved about 3d. per ton last week—that is, steamers engaged to load coals for London were paid 4s. 3d. per ton; the week before, the rate was 4s. per ton. Sailing vessels, to discharge at the wharves below bridge, were engaged at about 5s. 3d. per ton. Very little business indeed was done by either steam or sailing vessels to the Channel ports. The trade greatly favoured the shippers.

The chemical market kept firm last week. The advanced rates were fully maintained. Other manufacturing trades were quiet. Lead is selling at £14 10s. a ton, which is a rise upon recent quotations.

TRADE NOTES FROM SCOTLAND.

FROM OUR OWN CORRESPONDENT.)

On Wednesday last, the actual manufacture of gas was commenced at the new works of the Coatbridge Gas Company, Limited. In consequence of the extraordinary severity of the weather during the past winter, the completion of the works was very greatly retarded, and even yet there is a considerable amount of work to be done. The new works have been erected on a site of about 11 acres, on the north-east outskirts of the iron town, and on the line of the Glasgow, Airdrie, and Bathgate section of the North British Railway system. In every sense of the term, both site and works present a remarkable contrast to those where the gas manufacture of Coatbridge has been carried on since gas lighting was introduced into the town, in or about the year 1843, at the time when the full effects of the hot-blast invention and the discovery of the blackband ironstone were making themselves felt. So far as the works have been laid out and completed, they show that the Engineer and Manager (Mr. Robert Mitchell) has brought great professional skill to bear in the execution of his onerous duties. It is not necessary to give any full description of the works just now, but it may be mentioned that their cost will be nearly £22,000, and that amongst the contractors there may be mentioned the following:—Messrs. William Brodie and Co., and Messrs. Hanna, Donald, and Wilson, Paisley; the Airdrie Iron Company, and Messrs. Dempster and Son, Elland. As the next half-yearly meeting of the West of Scotland Association of Gas Managers is to be held in Coatbridge, the members generally are looking forward with interest to the opportunity that will thus be afforded them to inspect these very fine works; and I understand that Mr. Mitchell and the Directors of his Company are preparing to give them a hearty welcome. Another interesting feature of the visit of the gas managers to Coatbridge will doubtless be the inspection of Messrs. A. and J. Stewart's very extensive malleable iron tube-works, which are the largest of the kind in the Coatbridge district.

At a meeting of the Directors of the Wishaw Gas Company, held last Wednesday, the vacancy caused in the managership of the Company's works, by the sudden death of Mr. John Waddell, recently noticed in the JOURNAL, was filled up by the appointment of Mr. David Black, formerly of Falkirk.

The following is the Examiner's report, dated March 13, on the quality of the gas supplied to the town of Cupar-Fife:—"The average illuminating power of the gas supplied to the town during the past month, as ascertained from the usual testings, has been equal to 28·8 standard candles."

At a meeting of the Gas and Water Act Committee of the Inverness Police Commissioners, held on Monday, the 17th, the Provost reported that, in accordance with the instructions of the Commissioners, he had been to London to give explanations to the Lord Advocate regarding the requirements under the Provisional Order for which application had been made. His lordship went very minutely into all details, and, at the close of the interview, he (the Provost) fully expected that his lordship would grant more than their present requirements; and a letter since received from Mr. Simson, their Parliamentary Agent, confirmed his expectations. Mr. Simson stated that £15,000 was to be granted for the water scheme, and £5000 for gas. Those two sums exceeded the present wants by fully £5000. The Provost's report was minuted as satisfactory to the Committee, and a hope expressed that no more money might be required.

A meeting of the Limekilns and Charlestown Special Water Supply District Committee was held in Dunfermline last Monday—the Earl of Elgin presiding—when final arrangements were made in regard to the supply of water to Inverkeithing and Aberdour from the Glendevon scheme of the Dunfermline Corporation Water Commissioners; and at a meeting of the Managing Committee held last Wednesday, it was resolved to accept of Messrs. R Laidlaw and Son's tender for pipes, the sum amounting to £2088 6s. 11d.

The Dalserf Local Authority have resolved to go in for the Bothwell water supply scheme for the important weaving and mining village of Larkhall, providing that the supply can be obtained at a cost not exceeding 1s. per pound of rental.

The usual monthly meeting of the Greenock Water Trust was held last Tuesday afternoon, when the Superintendent submitted his report of water in store, which showed a total of 100 days supply for all purposes. The heavy rainfall on the 4th and 5th inst. had increased the quantity of water in store, and Loch Thom stood at 40 feet 7 inches, the increase being nearly 5 feet.

Edinburgh and Leith Gas Company's stock, which stood at £30 10s. last Monday, met with two advances during the week, the price paid being £31 15s. on Tuesday, and £32 5s. on Friday. Business was done on Friday in Aberdeen Corporation Gas Annuities at £5 17s. 6d. to £6. Glasgow Corporation 4 per cent. Water Annuities advanced on Friday from £101 to £102.

The Glasgow pig iron market was flat during the past week, and a good business was done at daily receding prices, the tone at the close of the week being still dull, when the price was 43s. 6d. to 43s. 4½d. cash, sellers remaining at the lower quotation, and at 43s. 6d. one month, buyers very near.

Dulness has been the rule in the coal market during the past week, and the prospects of a better trade are as indefinite as ever. The business is of a very restricted character, and, low as prices rule, they are barely maintained.

Sale of Gas Shares at Ashford.—On Tuesday, the 10th inst., six £10 fully-paid shares in the Ashford Gas Company were sold for £15 5s. each; one similar share for £16; and two £10 shares (£5 paid) for £16 10s.

Pangbourne and Whitchurch Gas Company.—The sixteenth annual meeting of this Company was held on Tuesday, the 11th inst., when a dividend of 5 per cent. was declared, and a balance was reserved to meet future requirements.

Dorking Gas Company.—At the half-yearly general meeting of this Company, held on Tuesday, March 18—Mr. J. Young in the chair—a dividend of 9 per cent. was declared, being £1 2s. 6d. per share on the class A shares, and 18s. per share on the class B shares.

A Caution.—We have been asked to put gas managers and manufacturers of gas apparatus on their guard against a grey-headed man who is going about the country trying to sell pens. Our informant says the man in question is acquainted with the names and abodes of many well known in the gas profession, and uses their names to gain an introduction. He has been "going away to New Zealand in a fortnight" for the last six or eight months; but seems to find his present occupation sufficiently paying to keep him in England.

Buenos Ayres Gas Supply.—The report presented to the Shareholders of the Buenos Ayres Gas Company, at their general meeting, on the 4th of December last, states that the profits obtained in the previous financial year amounted to 4,690,608 dollars m/c., out of which a dividend was declared of 20 per cent. We are informed of a circumstance in connection with this Company which does not often occur in the annals of gas companies—viz., that after the Directors had borrowed money to improve the works and had repaid the debt, the Shareholders received a bonus of two shares for every share held, and 18 per cent. dividend on each, being a profit of 254 per cent. on their original outlay.

Reductions in the Price of Gas.—Notice has been given that after to-day the Corporation of Stockport will supply gas to consumers inside the borough up to 500,000 feet at 3s. 4d., and over 500,000 feet at 3s. 3d. per 1000 feet. The prices to consumers outside the borough will be 4s. and 3s. 10d. per 1000 feet respectively.—The Radcliffe and Pilkington Gas Company have given notice that on and after the 31st inst. the price of gas in the districts supplied by them will be reduced from 5s. 5d. to 5s. per 1000 to consumers under 50,000 feet, and with a discount of 5 per cent. if accounts are paid within 21 days. Reductions are also to be made in the case of large consumers.—The Sevenoaks Gas Company announce that, on and after the 1st of April, the price of gas will be reduced from 5s. to 4s. 7d. per 1000 feet.

Fall of the Purifying-House Roof at the Paisley Gas-Works.—Shortly after 9 o'clock on Saturday morning, the 15th inst., the roof of the purifying-house at the Paisley Corporation Gas-Works fell in, burying the four purifiers, and causing a stoppage in the manufacture of gas until shortly after 6 p.m. The building, about 180 feet long and 78 feet wide, was only completed last year, and the roof was a double iron one, the apex of which was 24 feet from the ground, and was supported along its entire length on three rows of massive iron columns. Fortunately, the workmen were all at breakfast, otherwise there would have probably been a fatal termination to the accident.

Isle of Thanet Gas Company.—The half-yearly meeting of this Company was held at the Company's offices, Margate, on Friday, the 14th inst.—Mr. Bentley presiding. A statement of accounts was presented, and a dividend at the rate of 7½ per cent. per annum was declared. In moving the adoption of the report, the Chairman congratulated the Shareholders on the very satisfactory state of their business, the works being in good order, and the demand for gas on the increase. They had sufficient purifying space for double the present make of gas, and they were now supplying gas of from 14 to 15 candle power, at a lower rate than any other place on the coast. Other companies were paying a higher dividend; but the Directors preferred giving a good quality of gas at a cheap rate, feeling assured that an increased dividend would follow an increased demand.

Purston Gas Company.—On Tuesday, the 11th inst., the half-yearly meeting of this Company was held—Mr. J. Waller in the chair. Mr. Joseph Watson, the Secretary, opened the proceedings by reading the notice convening the meeting, also particulars of the balance-sheet. The Chairman said that he was happy to inform those present that the works were in very good working order. A new tank and gasholder had been constructed, which would considerably increase the storeage room. The extension of mains to Ackworth was now complete, and some 40 or 50 consumers had already been connected. He was pleased to state that there had been an increase in the income of the Company during the past half year of about £170, which was very gratifying. Mr. Lodge moved the adoption of the report and accounts. Mr. Robinson seconded the motion, which was carried unanimously. A dividend of 6 per cent. was declared. Messrs. Waller and Cowling were re-elected Directors, and a vote of thanks to the Chairman terminated the proceedings.

Purchase of the Ilkeston Gas-Works by the Local Board.—On Monday evening, the 17th inst., a special meeting of the Ilkeston Local Board was held in the Town Hall, under the presidency of Mr. W. Wade. The Clerk laid a written agreement before the Board, prepared by their consent. The agreement was between the Northern Insurance Company, London, and the Board, and the former agreed to lend the Board £20,000 for the purchase of the gas-works, on the security of the general district-rate, at 4½ per cent. per annum, to be repaid with interest in half-yearly instalments, extending over a period of 30 years. The agreement was read and discussed, after which it was agreed that the seal of the Board be attached thereto. Other smaller loans have been accepted by the Board, and arrangements have been made with the Ilkeston Gas Company for the sale of their works to the Board for the sum of £25,600, including £600 for their legal expenses. A meeting of the Directors of the Gas Company was held a few days ago, and arrangements were made for the payment of the purchase-money and the passing over of the works to the Local Board on the 26th of the present month.

Sale of New River Company's Shares.—At the Auction Mart, Token-house Yard, London, on Wednesday last, Messrs. Edwin Fox and Bousfield offered for sale one-fifth of a freehold share in the King's moiety, one twenty-fourth of a freehold share in the Adventurers moiety, and a few new shares in the New River Company. The whole of the original shares in this Company, 72 in number, are divided into two classes, one being called the King's moiety, the other the Adventurers moiety. These shares are freehold, or real estate, and entitle their holders to parliamentary voting powers for the counties of Middlesex and Hertford. They are of the nominal value of £22,000; but they actually realize in the market £95,000 per share. The new shares are of the nominal value of £100, and are of comparatively recent creation. Unlike the original shares, they are personal estate, and confer no voting powers on their holders; they, however, participate in all the other privileges of the original shares. The dividend on the original shares in 1862 was £898, while that for the year ending Midsummer last was at the rate of £2200; so that in 17 years it has increased 144 per cent., exclusive of bonuses. The Company's income for the year 1878 amounted to £416,332, being £17,700 more than for the year 1877. The shares sold on Wednesday comprised 46 lots, consisting of twelve 190ths of a King's moiety, fifteen 95ths of a King's moiety, four 96ths of an Adventurers moiety, and twenty £100 new shares, fully paid. Of the first group, lot 1 fetched £480; lots 2 and 10, £475; the remaining nine, £470 each. Three lots of the 95th parts fetched £945 each; ten were sold at £940; and for the remaining two £930 only was obtained, the rate of interest in these cases being somewhat lower. The four Adventurer's shares were knocked down to one buyer at £920 each. Of the 100 new shares, the first and two last put up for sale fetched £325 each; the remainder, £320 each. The New River Company's shares, being at an enormous premium, have always been readily bought up, and the prices at which they have hitherto been disposed of have been generally higher than those obtained on the present occasion, notwithstanding that the whole of the shares put up carried the Midsummer dividend. The entire proceeds of the day's sale, however, amounted to close upon £30,000.

Waste of Water in Glasgow.—At a meeting of the Glasgow Water-Works Commissioners on Thursday, the 13th inst., a report by the Engineer (Mr. Gale) on his recent operations for reducing the waste of water by district meters, and on extending the system, was presented. The following are the leading portions of it:—As recommended in my report on the Great Western Road experimental district of Oct. 23, 1876 [see Journal, Vol. xxviii., p. 854], and as instructed on the 14th of December of that year, the district meter system for detecting the waste of water has been extended over an area which now comprises 81,844 persons. The number of meters required for this population is 50, so that there are, on an average, 1637 persons to each meter. The districts were selected from various classes of property, excluding, however, the business part of the town, so as to obtain, as near as possible, a fair average of the whole city, and thus to give the system a fair trial. The fittings found out of repair, and the nature of the repairs made, were generally very much the same as in the Great Western Road district, though I have not made an analysis of these, as I did in the former case in my report of October, 1876. Lead service-pipes, too light to stand the pressure, and improperly exposed to the weather, were found to be fruitful causes of waste, together with that class of fittings which partly open at night, when the pressure in the pipes is highest. This last source of waste is very difficult of detection by the day inspectors, and, in fact, the fittings have sometimes to be watched during the night as well. You are well aware of the trouble there is in getting light service-pipes removed. The cost was £58 18s. 4d. per district for fixing meters, altering pipes, &c., and £27 8s. 10d. per district for the meters—in all, £86 7s. 2d. per district. As to the success of this effort to reduce the waste of water, there cannot be any question. The consumption per head, including all meter and trade supplies, average 49 gallons per day over the whole 81,844 persons when the meters were first placed. This was reduced to 32 gallons per head by the first three inspections, being a saving of 17 gallons per head per day, or about one-third of the whole. The night rate of consumption was reduced from 37·7 to 17·5 gallons per head per day, being a saving of 20·2 gallons, or rather more than one-half; but the manner in which this night rate is calculated gives results which are too high. The observations have shown that almost uniformly an increase took place in the quantity of water consumed in the nine weeks which elapsed between two inspections; and, taking the most reliable observations, I make the increase 3·4 gallons per head on an average. The total saving by the three first inspections was 17 gallons per head, so that if the consumption in a district continued to increase at the rate of 3·4 gallons per head in every nine weeks, and if the district was left without inspection, the original high rate of consumption would be reached in 10½ months. This result is deduced from an average, however, and would not follow if the chief attention were devoted to the worst districts. In some of the districts the increase was at the rate of only 2 gallons per head for nine weeks, so that these would not reach their originally bad state for a year and five months. In others the increase was at the rate of 7 gallons in nine weeks, so that they would come back to their original state in five months. It is these districts, therefore, that will receive the greatest attention in future. These are the principal facts as regards the 50 districts which have been under treatment, and I will now pass to the cost of extending the system over the whole area of supply. The present population supplied with water is 750,000, and, if three or four years elapse before the whole are brought under meter, it will then have reached 780,000. There are 80,000 persons already under meter, so that there are still 700,000 persons to provide for. At an average of 1687 persons to a district, there will be 427 districts, and 427 meters still to fix. What may be called the capital required for placing the whole area of supply under district meters will be as follows:—

Fixing meters, altering pipes, and repairing service stopcocks —427 districts, at £58 18s. 4d.	£25,157	8	4
Meters—427, at £29 5s.	12,489	15	0
First three inspections of 427 districts, at £12 14s. 8d.	5,431	15	11
	£43,078	19	3

If this is made a charge against revenue, as has been done in the case of the 50 present districts, and, as it has been done in Liverpool, the annual charge will be £14,360, if the work is spread over three years, or £9574 if spread over 4½ years. There is no immediate necessity, however, for reducing the gross quantity of water supplied to the city, and if it can be kept at near its present average, all the necessities of the case will be served. I have accordingly shown the sums which would have to be provided annually if the work were spread over ten years—that is, by bringing about 70,000 persons each year under the system. By doing it in this way the accumulation of interest under a sinking-fund, which is considerable in amount, would be avoided, and if the work is to be done at all, it is the manner which seems to commend itself. I estimate that the night inspectors, meter inspectors and repairers, and clerks required will cost £1130 a year, and this sum falls to be added to the annual expenditure for meters and altering pipes. We now have to consider the probable effect of this system of inspection upon the consumption of water, if it is extended over the whole area of supply. It is impossible to say what the net result will be, but I think if the saving is put at 10 or 12 gallons per head per day, it will be a moderate estimate. That amounts to from 7½ to 9 million gallons per day over the 780,000 assumed as the population that will be supplied three or four years hence. The water is costing the Commissioners at present about 20s. per 100,000 gallons, so that a saving of 9 million gallons per day would represent a saving of £32,850 per annum. After the experience I have now had of these district meters, I think they are an improvement over our present system of house to house inspection. The results can be reduced to figures from day to day, and the effects of each inspection, and the manner in which the inspectors discharge their duties, are put beyond doubt. This has led in Liverpool to a part of the remuneration of the men being calculated upon the results, and this might be advantageously introduced here also.

APPLICATIONS FOR LETTERS PATENT.

1006.—Meuter, E. de, jun., Brussels, "Improvements in the construction of burners for lamps, and in apparatus to be used in connection therewith." March 14, 1879.

1012.—Coke, A. L., Clifton, Bristol, "Improvements in the mode of obtaining electric lighting." March 14, 1879.

1026.—Lake, W. R., Southampton Buildings, London, "Improvements in the construction of lamps, chiefly designed for burning gas or petroleum." A communication. March 14, 1879.

1049.—Wilson, J. G., Manchester, "A new or improved water-meter." A communication. March 17, 1879.

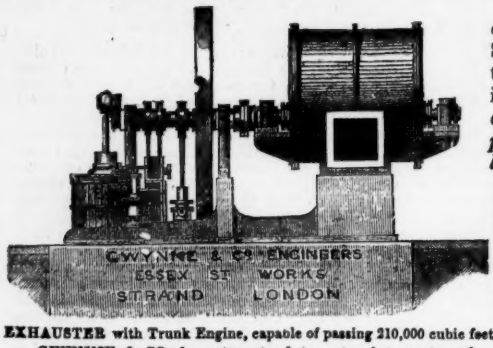
1063.—Corbett, J. W., Nottingham, "Improvements in burners, shades, and lamps." March 18, 1879.

1095.—Adams, J., Glasgow, "Improvements in gas-stoves." March 19, 1879.

1097.—Harrison, F. J., Notting Hill, London, "Improved attachments to fish-tail and other gas-burners for expanding and improving the light." March 19, 1879.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, TWO MEDALS at the PHILADELPHIA EXHIBITION and TWO MEDALS at the PARIS EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

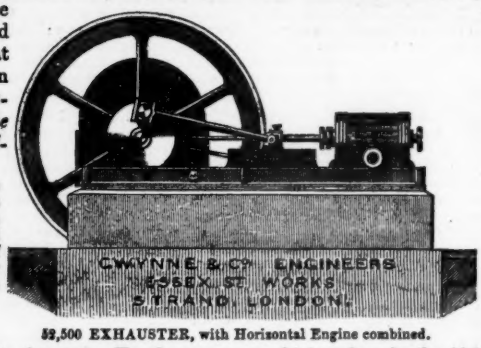
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 8,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas WITHOUT OSCILLATION OR VARIATION IN PRESSURE Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers, ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

BEALE'S IMPROVED PATENT GAS EXHAUSTERS

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Wrought-Iron Spindles and

ENGINES COMBINED.

SOLE MAKERS,

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MAKERS OF ENGINES, EXHAUSTERS, INDEX AND DISC GAS-VALVES, HYDRAULIC MAIN VALVES, BYE-PASS VALVES, TAR, LIQUOR, AND OTHER PUMPS, SCRUBBERS AND PURIFIERS, CONDENSERS, BOILERS, &c.

G. W. & Co.'s New Catalogue of Gas Plant and Machinery can be had on application.

Phœnix Engineering Works:

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TO GAS ENGINEERS.

D. BRUCE PEEBLES & CO.

Beg to call the attention of Gas Engineers to the fact that the novel and original feature in connection with PEEBLES' SYSTEM OF CONTROLLING THE ACTION OF GAS GOVERNORS is the loading or acting on the Bell by Pneumatic Pressure instead of Weights.

TAY WORKS. BONNINGTON, EDINBURGH.

WANTED, by the Advertiser, a Situation as MANAGER or FOREMAN, or Inspector, Collector, and Meter Fitter. Eight years experience. First-class testimonials.

Address A. B., 144, Lambeth Walk, London.

WANTED, by the Dartford Local Board of Health, a Practical GAS-FITTER. The person appointed must be thoroughly competent to Repair all Lanterns, Governors, Burners, Cocks, &c. He will also be required to undertake the Cleaning, and assist in Lighting and Extinguishing the Lamps. Salary 26s. per week.

Applications, personal or in writing, to be made to me not later than the 31st inst., accompanied by testimonials of recent date.

Geo. Mather, Surveyor.

SHREWSBURY GAS COMPANY.

WANTED immediately, a Manager and Secretary, thoroughly acquainted with the Engineering in connection with the Manufacture and Distribution of Gas, upon the most approved principles, also the general routine of office work. Salary, £300 per annum.

The person selected must give security in the sum of £500, and devote the whole of his time to the service of the Company.

Personal canvassing not allowed.

Applications, stating whether married or single, age, and experience, accompanied by testimonials of recent date, not exceeding four in number, to be forwarded to me, on or before the 3rd of April next, endorsed, "Application for Manager."

By order,

S. B. Darwin, Secretary and Manager.

March 6, 1879.

TO GAS STOKERS.

WANTED, a Night Stoker, at a small Country Gas-Works. Help allowed in the winter months. Wages to commence at 24s., and rise to 28s. to a suitable man. Only those accustomed to the work need apply.

Address No. 535, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

THE Advertiser, aged 28, is desirous of a Situation as ENGINEER and MANAGER of medium-sized Works, or as Working MANAGER of small Works. Has a thorough practical knowledge of his business. Excellent references as to character and ability.

Address Z., care of Mr. Hawkes, 10, Great King Street, Birmingham.

WANTED, Readers of the NEW Edition, 1879, "Cooking & Heating by Gas;" on Burners, &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, A.I.C.E., Gas-Works, SYDENHAM, S.E.

WANTED, by the Advertiser, a Re-engagement as MANAGER of a Gas-Works. Has had many years thorough practical experience in the actual Management of Gas-Works and Repairs. Can design and carry out any extension or alteration required. Good references.

Address No. 534, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Sowerby Bridge Local Board of Health, a Steady Man as METER INSPECTOR and REPAIRER. Applications, to state age, experience, salary required, and enclosing recent testimonials, to be sent in not later than Six p.m. on Thursday, April 3, addressed to the Chairman of the Gas Committee, and endorsed "Meter Inspector."

By order,
GEORGE E. SAVILLE, Manager.
Sowerby Bridge, March 21, 1879.

WANTED, by a Young Man (married), a Situation as MANAGER, or Secretary and Manager, of a small Gas-Works, or Assistant in a larger one. Has had considerable experience in the Manufacture and Distribution of Gas in all its branches; five years sole Manager. No objection to any place in the United Kingdom. Satisfactory reasons for change. Unexceptional references and testimonials.

Address, in first instance, No. 526, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO BUILDERS AND GASHOLDER MAKERS.

THE Directors of the Woodbridge Gas-light and Coke Company, Limited, invite TENDERS and SPECIFICATION for the Erection of a new GASHOLDER, 42 ft. diameter, 20ft. deep, and TANK for same, complete, with 6-in. inlet and outlet pipes, water-trap valves, &c.

The lowest or any tender not necessarily accepted.

BENJAMIN. D. GALE, Secretary.

CHARD GAS AND COKE COMPANY, LIMITED.

THE Directors of the above Company are prepared to receive TENDERS for LEASE of their Works for a term of 10 or 14 years.

Endorsed tenders to be delivered on or before the 2nd of April.

The Directors do not pledge themselves to accept the highest or any tender.

Particulars may be obtained of Mr. J. CATFORD, Secretary

GAS TAR.

THE Directors of the Normanton Gas Company are prepared to receive TENDERS for the TAR made at their Works at Normanton for One year, from April 1, 1879, to March 31, 1880.

Sealed tenders, endorsed, to be sent in, addressed to the Chairman, on or before the 4th of April.

The Directors do not bind themselves to accept the highest or any tender.

Further information may be had on application to
JOHN ARMITAGE, Secretary and Manager.
Normanton, March 22, 1879.

NEWPORT (MON.) GAS COMPANY.

TO TAR DISTILLERS.

THE Directors of the Newport (Mon.) Gas Company are prepared to receive TENDERS for the Purchase of the Surplus TAR produced at their Works for a period of One year.

Sealed and endorsed tenders to be sent in not later than the 2nd of April next.

By order of the Directors,
EDWARD F. MARPLEET, Secretary.
Gas Offices, Newport (Mon.), March 21, 1879.

TO COAL MERCHANTS.

THE Directors of the Horsham Gas Com-pany, Limited, in Sussex, invite TENDERS for a Supply of COALS for One year, commencing May 1, 1879.

The Coals to be either Pelaw Main, Holmside, or Peltons.

The quantity required will be from 100 to 250 Tons per month, as may be ordered.

The Coals to be delivered at the Horsham Rai'way Station, carriage paid, and to be paid for within Two months of the date of delivery.

Sealed tenders, endorsed "Tender for Coals," to be sent to the undersigned on or before Saturday, April 12.

ROBERT SHEPPARD, Secretary.

DARWEN CORPORATION.

TENDERS FOR RETORTS, BRICKS, &c.

THE Gas Committee of the above Cor-poration invite TENDERS for the Supply of 112 Retorts, and the Bricks, Fire-Clay, &c., necessary for Setting same.

Particulars and forms of tender may be obtained at this Office.

Sealed tenders, endorsed "Tender for Retorts, &c.," to be sent to C. Costeker, Esq., Town Clerk, Darwen, on or before March 31, 1879.

THOMAS DUXBURY, Manager.

BOROUGH OF HALIFAX.

TO IRONFOUNDERS.

THE Gas-Works Committee of the Halifax Corporation invite TENDERS for the Supply of 1000 Yards of 4-in. Cast-Iron PIPES, and 1000 Yards of 3-in. Cast-Iron PIPES.

Specifications may be seen, and forms of tender obtained, on application to Mr. William Carr, Manager of the Gas-Works, Halifax.

Tenders, properly endorsed, must be sent to me on or before the 3rd of April, 1879.

By order,
A. C. FOSTER, Town Clerk.
Town Hall, Halifax, March 21, 1879.

ARMAGH GASLIGHT COMPANY, LIMITED, IRELAND.

THE Directors of the above Company are prepared to receive TENDERS for the Erection of four PURIFIERS, 9 ft. square by 4 ft. deep, inside measure, with 12 in. Water Lute for Covers, four sets of Wood Grids in each, and Centre-Valve complete.

Each tender to contain a Tracing of Purifiers, Valve, &c.

The Directors do not bind themselves to accept the lowest or any tender.

Sealed tenders to be lodged with me not later than the 21st of April next.

By order,
JOSEPH GIBB, Manager.
Gas-Works, Armagh, March 20, 1879.

ULVERSTON LOCAL BOARD.

GAS AND WATER DEPARTMENT.

THE Gas and Water Committee invite TENDERS for the Supply of 1200 Tons of COAL and 250 Tons of CANNEL for Gas purposes; to be delivered in such quantities and at such stated periods as may be required during the 12 months ending June 30, 1880.

The Coal and Cannel offered are to be the best of their kind, and must be as free as possible from all bats, pyrites, and dirt.

Parties tendering must give full particulars of the Coal and Cannel offered, and the colliery from which they propose to supply, and state the price per ton delivered, carriage paid, to Ulverston Station.

Where a tender is received for the supply of both Coal and Cannel, it must be understood that the Committee is to be at liberty to accept a portion of such tender.

Sealed tenders, addressed to the undersigned, will be received until the 5th of April.

JNO. SWAN, Engineer and Manager.
March 22, 1879.

TO BOILER MAKERS AND OTHERS.

THE Directors of the Dover Gaslight Company invite TENDERS for the Supply of a Cornish BOILER, 5 ft. in diameter and 30 ft. long, the drawings and specifications of which can be seen, on and after Monday, the 17th of March inst., at my Office, or at the office of their Engineer, Mr. Thomas N. Kirkham, 21, Abingdon Street, Westminster.

The party whose tender may be accepted will be required to enter into an agreement to supply the boiler according to the terms of the specification.

The Directors do not bind themselves to accept the lowest or any tender.

No tender will be received unless it is made upon one of the Company's printed forms, marked "Tender for Boiler," and delivered at my office, 14, Snargate Street, Dover, on or before Eleven o'clock a.m., on Saturday, March 29, 1879.

G. FIELDING, Secretary.

TENDERS FOR GASHOLDER.

THE Directors of the Dover Gaslight Company invite TENDERS for the construction of One Lift of a Telescopic GASHOLDER, 82 ft. diameter, and 24 ft. deep, with Standards, &c., at their Buckland Works, drawings and specifications of which can be seen, and form of tender obtained, at my Office, or at the Office of their Engineer, Mr. T. N. Kirkham, 21, Abingdon Street, Westminster, any day after the 27th of March inst., between the hours of Ten and Four.

The party whose tender may be accepted will be required to enter into a contract with two sureties for the due performance of the works.

The Directors do not bind themselves to accept the lowest or any tender.

No tender will be received unless it is made upon one of the Company's printed forms, marked "Tender for Gasholder," and delivered at my Office, 14, Snargate Street, Dover, on or before Eleven o'clock a.m., on Saturday, April 12, 1879.

G. FIELDING, Secretary.

TO CONTRACTORS AND OTHERS—TENDERS FOR GASHOLDER-TANK.

THE Directors of the Dover Gaslight Company invite TENDERS for the Construction of a Brick and Puddle GASHOLDER-TANK at their Buckland Works, drawings and specification of which can be seen, and form of tender obtained, at my office, or at the office of their Engineer, Mr. T. N. Kirkham, 21, Abingdon Street, Westminster, any day after the 15th of March inst., between the hours of Ten and Four, where Bills of Quantities can be obtained on payment of £2 2s., which will be returned on the receipt of a *bonâ fide* tender.

The party whose tender may be accepted will be required to enter into a contract with two sureties for the due performance of the works.

The Directors do not bind themselves to accept the lowest or any tender.

No tender will be received unless it is made upon one of the Company's printed forms, marked "Tender for Tank," and delivered at my office, 14, Snargate Street, Dover, on or before Eleven o'clock a.m., on Saturday, March 29, 1879.

G. FIELDING, Secretary.

THE Hampton Court Gas Company have FOR SALE, One 40 ft. by 16 ft. GASHOLDER, with six Cast Columns and Wrought Girders, to be Sold very cheap, as the position is wanted.

Also the following PLANT, the who'e of which is in excellent condition, having been removed for larger:—

One 8-horse Power Vertical Engine.
One 20,000 ft. Beale's Exhauster.
One 15,000 do. do.
Two Beal.'s Slide-Valves.
Two Waller's Dis'-Valves.
One 8-in. Bye-Pass Valve.
One 20-in. diameter Exhaust Governor.
Three Biggers.
One 3-in. Cast-Iron Pump, Fowler's make.
One 2-in. do. do.
Driving Gear for the two Pumps.
One 3-in. Brass Valve Pump, with Driving Gear.
One Cast-Iron Scrubber, 12 ft. high by 5 ft. 6 in. diameter, with 8-in. connections.
Three 8-in. Donkin's Valves, 8-in. Pipes, Bends, &c., for connections.
Two Small Washers and Connections.

For further information, apply to Mr. E. PRICE, Engineer and Manager, Gas-Works, HAMPTON WICK.

NEWPORT (MON.) GAS COMPANY.

TO CONTRACTORS.

THE Directors of the above Company invite TENDERS for the Supply and Erection of a Set of three PURIFIERS (each 15 ft. by 12 ft.), with Centre-Valve and all connections complete, at the Gas-Works, Newport (Mon.).

Further particulars may be had, and drawings and specification examined, in the Office of the undersigned, at the Works.

Sealed tenders, addressed to the Chairman of the Company, to be forwarded not later than Thursday, April 3, 1879.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
THOMAS CANNING, Engineer.
Gas-Works, Newport (Mon.), March 22, 1879.

ULVERSTON LOCAL BOARD.

GAS AND WATER DEPARTMENT.

THE Gas and Water Committee invite TENDERS for the Purchase of the Surplus TAR and AMMONIACAL LIQUOR Manufactured at their Works for a period of One, Two, or Three years, commencing July 1, 1879.

The quantity of Tar to be disposed of annually will be about 100 tons, and of Ammoniacal Liquor 160 tons.

Contractors to state price per ton at these Works for both Tar and Liquor (the Liquor to be of 6 degrees Twaddell), and the extra price they are prepared to give for every additional degree, as tested by Twaddell's Hydrometer.

Sealed tenders, addressed to the undersigned, will be received until the 5th of April.

JNO. SWAN, Engineer and Manager.
March 22, 1879.

RIO DE JANEIRO GAS COMPANY, LIMITED.

The SHAREHOLDERS are hereby informed that the FOURTEENTH ANNUAL GENERAL MEETING of this Company will be held at the Cannon Street Hotel, Cannon Street, on Thursday, the 3rd day of April next, at Twelve o'clock at noon precisely, to receive and confirm the Directors report and balance-sheet for the year ending the 31st of December last, and to declare a Dividend; also that the Transfer Books are closed from to-day's date to the 3rd proximo, both days inclusive.

By order,
THOMAS DAWSON, Secretary.
No. 1, Gresham House, Old Broad Street,
London, E.C., March 21, 1879.

PHŒNIX GASLIGHT AND COKE COMPANY.

NOTICE is hereby given that the ADJOURNED HALF-YEARLY GENERAL MEETING of the PROPRIETORS holding, previous to the 31st of December last, £300 and upwards of paid-up capital, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 2nd of April, at Two o'clock precisely, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring Dividends to the 31st of December last, to elect Directors and Auditors for the ensuing year, and on other business.

The Transfer Books will be closed on and after the 13th of March, and reopened on the 3rd of April.

By order of the Court of Directors,
ISAAC ADOLPHUS CROCKENDEN, Secretary.
70, Bankside, London, S.E., March 5, 1879.

TOTTENHAM AND EDMONTON GAS-LIGHT and COKE COMPANY.

NOTICE is hereby given that the HALF-YEARLY ORDINARY GENERAL MEETING of PROPRIETORS in this Company will be held at the Works, Willoughby Lane, Tottenham, on SATURDAY, the 5th day of April next, at Three o'clock in the afternoon precisely, to receive the Report of the Directors, the Statement of Accounts for the Half Year ended the 31st December, 1878, to declare Dividends, and for transacting such other business as the Act of Parliament directs.

The Transfer Books will be closed on Friday, the 21st inst., until after the Meeting.

The Dividends to be declared will be payable on and after Monday, the 7th of April next.

By order,
JAMES RANDALL, Secretary.
Offices, Edmonton, March 21, 1879.

SWANWICK CANNEL.

Illuminating power, 24 candles. Good Coke, 11¼ cwt. to the ton.

For analysis, prices, and references, apply to
H. BOAM, Litchurch Villa, DERBY.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

BRAY'S
NEW BURNERS.
40, 50, 60, 70, and 80
CANDLE POWER.

See Page 453.

GAS COAL.

THE MIRFIELD COAL COMPANY are supplying GAS COAL of the best quality on trucks at their siding. This Coal contains 10 per cent. of Cannel, and, as analyzed by Mr. James Paterson, of Warrington, yields 12,600 *cubic feet of* 16·67 *candle gas, with* 1450 *lbs. of good Coke, per ton.* Ash in Coke, 1·88.

Apply to the MIRFIELD COLLIERY, Mirfield, NORMANTON.

GAS SHARES IN THAT MOST PROSPEROUS CONCERN, THE UXBRIDGE GAS COMPANY.

ABOUT 250 Ten Pound Shares in the above Company, to be SOLD BY AUCTION, by Messrs. Heron and Sons, at the Chequers Hotel, Uxbridge, Middlesex, on Thursday, March 27, 1879, at Two for Three o'clock, in Lots of from Two to Ten Shares each.

The Shares are fully paid up, and are in receipt of the maximum dividend allowed by the Act of Parliament—viz., in the respective cases, 7, 7½, and 10 per cent. per annum, and will be sold with the accruing dividend from Christmas last.

This is an excellent opportunity for investing money safely at a really good rate of interest.

Particulars may be obtained of Messrs. HERON AND SONS, Auctioneers and Valuers, Uxbridge, MIDDLESEX.

TENDER FOR NEW RETORT-BENCH.

THE Town Commissioners for Bandon are desirous of receiving PLANS, SPECIFICATIONS, and TENDERS for a new BENCH OF RETORTS, to be erected complete, with new Hydraulic Main, Mouth-Pieces; Bridge, Dip, and Ascension Pipes; Furnace Doors, and all Fittings complete, and ready for making Gas.

The retort-house is 26 feet inside walls, and in that space they would require one setting of nine retorts, one setting of six retorts, and two settings of three retorts each, in all 21 retorts.

Tenders to include all materials and carriage, and to be lodged with me on or before Saturday, the 5th of April next.

The work to be subject to the approval of such person as the Town Commissioners may select.

S. R. TRESILIAN, Clerk to Town Commissioners.

CITY OF HEREFORD.

CONTRACT FOR GAS COAL.

THE Gas Management Committee of the Hereford Corporation hereby invite TENDERS for the Supply of Best GAS COALS, required for One or Two years from the 1st of May next. The quantity will be 5000 to 5500 Tons per year.

The whole of the coal to be well screened, free from bats, dirt, or pyrites, and fit for gas-making purposes, to the satisfaction of the Manager of the GAS-Works.

Parties tendering, to quote price put into the Corporation's waggons at the pit.

Tenders, endorsed on the outside, and addressed "Chairman, Gas Management Committee," are to be delivered by Eleven a.m. on Tuesday, the 1st day of April next.

The said Committee do not bind themselves to accept the lowest or any tender.

By order,
WILLIAM DAVIS, Engineer.

March 11, 1879.

TO IRONFOUNDERS.

THE Directors of the Radcliffe and Pil- kington Gas Company are prepared to receive TENDERS for the following Cast-Iron Spigot and Socket PIPES, with various Branches and Connections, delivered at Radcliffe station, on the Lancashire and Yorkshire Railway:—

200	yards,	8	inches diameter, in	9-feet	lengths.
1200	,,	10	,,	9	,,
300	,,	12	,,	12	,,
550	,,	18	,,	12	,,

Specification, quantities, and form of tender, may be had on application to Mr. Thomas Newbiggin, C.E., No. 5, Norfolk Street, Manchester, and to the undersigned at the Gas Office.

Sealed tenders, endorsed "Tender for Main-Pipes," to be sent in, addressed to the Chairman of the Company, on or before Thursday, the 27th inst.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
JOHN BRANDWOOD, Manager and Secretary.

Gas Offices, Radcliffe, March 12, 1879.

PATENT
MACHINE-MADE RETORTS.

B. GIBBONS, JUN.,

STOURBRIDGE.

Now ready, Second Edition, price 7s., by post 7s. 3d., the

GAS MANAGER'S HANDBOOK.

By THOMAS NEWBIGGING, M.I.C.E.

Orders to be sent to

WALTER KING,

11, BOLT COURT, FLEET STREET, LONDON, E.C.

KÖRTING'S STEAM-JET EXHAUSTER.

IMPROVED CLELAND'S PATENT.

UPWARDS OF 300 IN USE.

CLELAND'S SLOW-SPEED CONDENSER & STEAM SCRUBBER

FOR PARTICULARS, APPLY TO

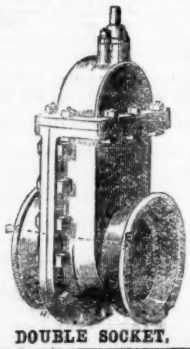
KÖRTING BROS.,

17, LANCASTER AVENUE, MANCHESTER,

OR TO

GERALD J. TUPP, Creek Engine-Works,
Middle Mall, Hammersmith, London, W.

SOLE AGENT FOR ENGLAND AND WALES.



DOUBLE SOCKET.

IMPROVED

SCREW WATER-VALVES,

WITH GUN-METAL FACES.

Proved to 400 feet head of water before leaving the Works

MADE EITHER WITH FLANGED OR SOCKET ENDS.

B. DONKIN & Co.,

BERMONDSEY, LONDON, S.E.

ECONOMY IN THE PRODUCTION OF GAS.

PLUTONIC CEMENT,

FOR JOINTING AND REPAIRING RETORTS AND OVENS *in* ACTION AND *out* OF ACTION.

A Pamphlet on the advantages of the above, with Modes of Application, References, Prices, &c., free by post, from the Sole Manufacturer,

WILLIAM RICHARDSON, Gas and Hydraulic Engineer, CHARLES HENRY STREET, and BISSELL STREET, BIRMINGHAM.

Now Ready, Price One Guinea,

PRECEDENTS IN PRIVATE BILL LEGISLATION

AFFECTING GAS AND WATER UNDERTAKINGS.

COMPILED BY MR. G. W. STEVENSON, C.E., F.G.S.

This Work contains information with regard to the practice of Parliament during the last fourteen years, in regard to most of the points on which differences arise in Opposed Bills for Gas and Water Undertakings, comprising—Authorized share and loan capital, Rates of dividend, Capitalization of profits, Term for the repayment of loans, Instances in which new shares are to be sold by auction and Exceptions to the Standing Order requiring new shares to be sold by auction, The limitation of back dividends, Illuminating power, Purity, Price, Notice before testing, The conditions under which the public supply of gas is regulated, Alteration of mains, Instances in which maps of mains are required, and All cases in which undertakings have been transferred, since 1845 in gas and 1865 in water, from Companies to Local Authorities.

In the Water Precedents will be found, in addition, The rates for a supply for domestic purposes, and the Rates for other than domestic purposes.

LONDON: WALTER KING, 11, BOLT COURT, FLEET STREET, E.C.

ANDREW & JAMES STEWART,

CLYDE TUBE WORKS, GLASGOW & COATBRIDGE.

OFFICES AND WAREHOUSE: 41, OSWALD STREET, GLASGOW.

WROUGHT-IRON TUBES AND FITTINGS

FOR GAS, STEAM, AND WATER.

Hot Water Tubes, Core Bars, Lap-welded Iron Boiler Tubes.

CAST-IRON PIPES for GAS & WATER.

Brass and Gun-Metal Fittings, Valves, Cutting and Screwing Tools, &c.

THE THAMES BANK IRON COMPANY,

(Successors to LYNCH WHITE,)

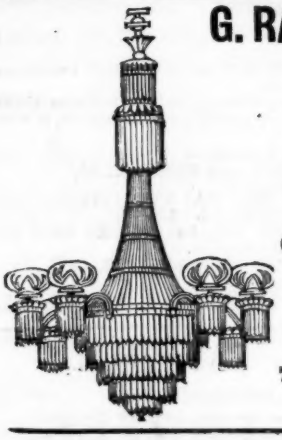
SUPPLY FROM STOCK

CAST-IRON RETORTS, SOCKET-PIPES for GAS or WATER PURPOSES, FLANGE-PIPES for STEAM, RAIN-WATER PIPES and GUTTERS, HOT-WATER PIPES and BOILERS, and all requisite Connexions for same; also LAMP-COLUMNS, LAMPS, WROUGHT FRAMES, WROUGHT-IRON TUBING, &c., &c.

All kinds of Gas-Works Apparatus and General Castings made to Pattern or Drawing.

ADDRESS—

OLD BARGE WHARF, UPPER GROUND STREET, LONDON, S.E.



G. RAINSFORD & SON,

ESTABLISHED 1850,

MANUFACTURERS

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CHANDELIERS

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GAS-FITTINGS,

SUITABLE FOR

GAS COMPANIES.

70, BROAD STREET,

BIRMINGHAM.

AMMONIACAL LIQUOR.

SPENCE and STEUART, Frizinghall, near Shipley, YORKSHIRE, are Purchasers of above.

FURNACE BUILDER AND RETORT SETTER.

W. HAILES Contracts for the Erection of Retort Benches, Settings of Retorts on all the most improved principles, in large or small works. Twenty years experience both in London and Provinces. Price List on application.

Address 3, High Street, Brentford, MIDDLESEX.

WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.

John Leigh, Esq., M.R.C.S., F.C.S., &c., &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity, I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

TO INVESTORS IN STOCKS AND SHARES.

MESSRS. WRENN & Co., Brokers, Financial Agents, Auctioneers, &c., will be happy to negotiate for the Sale or Purchase of Gas, Docks, Water-Works, Canal and other securities on moderate terms. Periodical Sales by Public Auction, where equitable prices can be ensured. Holders of Local Provincial Gas and Water Shares are respectfully solicited to communicate with the above at their offices, 4, Copthall Chambers, LOTHBURY.

E. & W. H. HALEY,

IRONFOUNDERS & MAKERS OF

CAST-IRON PIPES

FOR

GAS, WATER, & STEAM.

LISTER HILLS FOUNDRY,

BRADFORD, YORKSHIRE.

W. C. HOLMES & Co.,

ENGINEERS AND CONTRACTORS

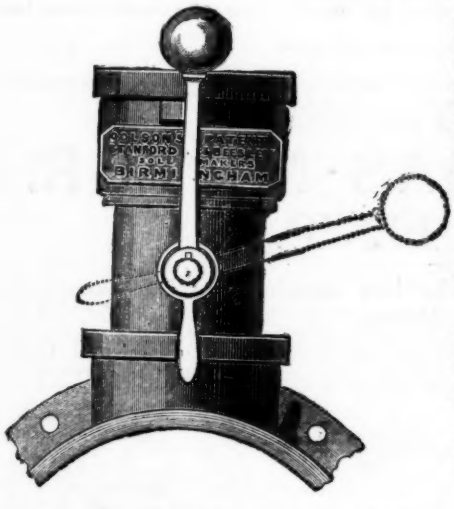
FOR

GAS AND WATER-WORKS,

HUDDERSFIELD.

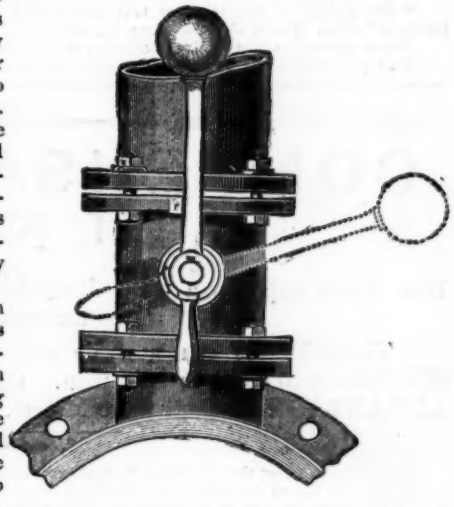
REFERENCES TO UPWARDS OF 400 WORKS.

COLSON'S PATENT ASCENSION-PIPE THROTTLE-VALVE.



THIS Valve is designed to supersede the hydraulic seal, and is intended to be placed immediately in or on the retort mouthpiece, or at such a distance therefrom as to be within reach of the workman. By the use of these Valves, the whole of the pressure is removed from the retorts, and a largely increased make of gas per ton obtained; the deposit of carbon is very slight, choked ascension-pipes are unknown, and the quality of the coke is improved.

When the retort is being drawn or charged, the lever, which is attached to a Spindle and Throttle-Valve, is thrown over as shown by the dotted lines, thereby closing the ascension-pipe; but when the retort is sealed, the lever is placed in a vertical position, and a free way made for the gas to pass to the relieving main.



The Valves (upwards of two hundred in number) supplied to the Gas Committee of the Corporation of Birmingham, for their Windsor Street Works, continue to give complete satisfaction, and no difficulty has been experienced in working retorts fitted with them in combination with others worked in the usual way with the hydraulic seal.

The following important testimonial has been received:—

Corporation of Birmingham Gas Department, Windsor Street Works, Feb. 17, 1878.

MESSRS. STANFORD AND BEESLEY.

DEAR SIRS,—In reply to your inquiry, I beg to say that the Valves (Colson's Patent) supplied by you in July last have given entire satisfaction. The retorts fitted with them are worked side by side with others having the ordinary dip-pipe, without any difficulty being experienced.

Yours truly, (Signed) CHARLES HUNT.

For further Particulars, apply to

Messrs. STANFORD and BEESLEY,

General Engineers and Sole Makers of COLSON'S PATENT ASCENSION-PIPE THROTTLE-VALVE,

89, DARTMOUTH STREET, BIRMINGHAM.

THE HYDRAULIC MAIN ENTIRELY SUPERSEDED.

AN increased yield of gas, and of augmented illuminating power, is obtained by employing WHITE'S AUTOMATIC VALVE, and dispensing with the Hydraulic Main, the tar of which, as is well known, absorbs the rich constituents of the gas consequently, diminishes alike the quantity and quality.

Further particulars, &c., upon application to WILLIAM WHITE, Gas-Works, Abersychan, MON.

A Pamphlet descriptive of the above method, post free, 6½d.

Price 28s., handsomely bound in Morocco, cloth sides, gilt edged and lettered.

THE FIRST VOLUME OF

KING'S TREATISE

On the Science and Practice of the Manufacture and Distribution of

COAL GAS.

Edited by THOS. NEWBIGGING, C.E., M.Inst.C.E., and W. T. FEWTRELL, F.C.S.

Orders received by WALTER KING, 11, Bolt Court, Fleet Street, London, E.C.

Prices, half bound, cloth sides, 2 quires, 30s.; 3 quires, 36s.; other sizes and bindings to order.

THE

GAS COMPANIES

EXPENDITURE JOURNAL,

Being a Ruled Account-Book with Printed Headings, and Analyzing Guide for Keeping, upon the easiest and most correct method, the Expenditure of a Gas Company, in accordance with the provisions of the Gas-Works Clauses Act of 1871, and suitable for all Companies.

Specimen, with illustration and full particulars; 2s. 6d. returned on the purchase of a "Journal."

Published by EDWARD SANDELL, Accountant, 2, Great George Street, WESTMINSTER, and W. KING, Office of the JOURNAL OF GAS LIGHTING, 11, Bolt Court, FLEET STREET, E.C.

TO ENGINEERS & MANAGERS.—CLIFTON'S

PATENT COKE AND COAL BARROW

Is acknowledged to be the best Barrow in the Market.

For particulars, with Drawings and Prices, apply to the Sole Makers,

THORNELOE & COMPANY,
ENGINEERS AND CONTRACTORS,
87, BARBICAN, LONDON, E.C.

COMMERCIAL GLASS WORKS, 27, WELLCLOSE SQUARE, LONDON, E.

CHEAPEST HOUSE IN THE TRADE FOR GAS GLASSES OF EVERY DESCRIPTION

Write for Lists, free on application to any part of the World.

J. & H. ROBUS,

BUILDERS AND CONTRACTORS

FOR THE ERECTION AND REBUILDING OF GAS AND WATER WORKS,

RETORT-SETTING—A SPÉCIALITÉ.

ROBUS'S IMPROVED RETORT-SETTINGS, guaranteed to Carbonize a large amount of Coal with a small per cent. of Fuel.

ESTIMATES GIVEN FOR MAIN-LAYING.

N.B.—All kinds of Fire Goods and Gas Apparatus supplied on the shortest notice.

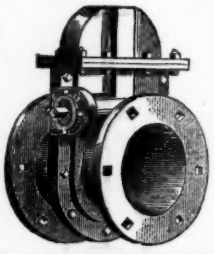
Address:—J. & H. ROBUS, BELL GREEN, CATFORD, LONDON, S.E.

B. DONKIN & CO.'S

IMPROVED GAS-VALVES

WITH WROUGHT-IRON PINIONS.

TRADE MARK.



List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.

These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock.

In ordering Valves, please state whether required for under or above ground, and if to be with flanges or spigots and sockets cast on, or with separate spigot and socket pieces.

ALSO SOLE MAKERS OF

J. BEALE'S NEW PATENT GAS EXHAUSTERS,
AND MAKERS OF
STEAM-ENGINES FOR DRIVING GAS EXHAUSTERS,
VALVES FOR AMMONIACAL LIQUOR,
IMPROVED BRIDGE VALVES FOR REGULATING THE SEAL IN HYDRAULIC MAINS,
BYE-PASS VALVES, SCREW WATER-VALVES, &c.

B. DONKIN & CO., 55a BLUE ANCHOR ROAD, BERMONDSEY, LONDON, S.E.

GAS COAL. GAS COAL. GAS COAL.

WELLS, BIRCH, RYDE, and CO., Limited,

HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise 2000 tons per day of REAL OLD SILKSTONE GAS COAL.

"The quality of this Coal for Gas purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, Aug. 11, 1877.

Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

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COMPENSATING GAS-METER.

HUNT'S PATENT.

This Meter supplies a want long felt, by putting an end to the loss sustained by Gas Companies through the overworking of their Meters.

These Meters can now be supplied in either TIN-PLATE or CAST-IRON CASES, and OLD METERS converted to this plan. GAS COMPANIES and CORPORATIONS will find it to THEIR ADVANTAGE to adopt these Meters.

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"I am able to report that the Meters have given in each test most satisfactory results."—*Mr. H. Sporne, City of London Meter Inspector.*

"I consider the arrangement is a great improvement upon the Meters in present general use."—*Mr. T. Jackson, Meter Inspector, Birmingham.*

"I would observe from the results of my testings that the Meters are a great improvement on the ordinary Wet Meters in general use."—*Mr. H. Airey, Meter Inspector to the Metropolitan Board of Works.*

COPIES OF REPORTS SENT ON APPLICATION.

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WET AND DRY GAS-METER AND GAS APPARATUS MANUFACTURERS,

BELL BARN ROAD, BIRMINGHAM.

Established 1830.

BRAY'S

"STANDARD"

FLAT-FLAME BURNERS.

(PATENT SLIT UNIONS.)

LIGHTING POWER—40, 50, 60, 70, and 80 CANDLES.

In consequence of the demand for Burners of extra Power for Lighting Large Spaces, we have introduced Burners of the above lighting power, which give from TWELVE to TWENTY per Cent. more light per cubic foot of gas consumed than any Flat-Flame Burner hitherto introduced.

Photometrically, with 16-candle gas, our New Standard Burners yield a result equal to the best Argands of similar consuming power; while, *in actual use*, we are prepared to demonstrate a yield of light 20 per cent. *superior* to the best Argands. With 20-candle gas and upwards, the *photometrical* superiority is greatly in favour of our New Burners.

FOR STREET-LAMP PURPOSES there is no liability of the lamps being filled with carbon by a governor getting out of order, as will be the case where Argands are used; and, as they are lighted in the ordinary way, there is no necessity to keep a small jet burning all day in order to light the Burner at night.

GEORGE BRAY & CO.'S

"ENAMEL" GAS-BURNER WORKS,

BLACKMAN LANE,

LEEDS.

HENRY LYON (14 years Engineer and Manager of the largest of the Manchester Corporation Gas-Works) Mechanical and Consulting Gas Engineer, reports upon the condition and value of Gas-Works, supplies plans and specifications of all Apparatus appertaining to Gas-Works, and re-models existing Works.
Address Brooklyn, near Halliwell Lane, Cheetham Hill Road, MANCHESTER.

W. LIDDALL,
Public Accountant,
MOORGATE STREET CHAMBERS,
GREAT SWAN ALLEY,
MOORGATE STREET, E.C.

Mr. ROBERT DEMPSTER,
CONSULTING GAS ENGINEER,
ELLAND, near HALIFAX,
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SPECIAL ACCOUNTANT FOR GAS COMPANIES,
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Accounts analysed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.
The Forms of Account, which have been specially designed to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, and have been universally approved.
The above forms are registered.
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RETORT BOLTS,
AND ALL KINDS OF
BOLTS AND NUTS,
SUITABLE FOR
GAS-WORKS,
SUPPLIED BY
JOHN STANSFELD,
Bolt & Nut Manufacturer,
ALFRED ST., BOAR LANE, LEEDS.

CADZOW COAL COMPANY,
LIMITED.
Cadzow Collieries, Hamilton (Lanarkshire).
Office: 161, Hope Street, Glasgow.

Report on the Cadzow Ell Coal.
By Dr. W. WALLACE, F.R.S.E., F.C.S., Gas Examiner for the City of Glasgow.
I have made a careful chemical analysis and practical assay of an average sample of the Ell Coal from Cadzow Colliery, received on the 5th inst., from Messrs. The Cadzow Coal Company, Hamilton, and have obtained the following results:—

Analysis.

Volatile matters	Gas, tar, &c.	34·03	
	Sulphur	·04	46·12
	Water, at 212° Fahr.	12·05	
Coke	Fixed carbon	52·90	
	Sulphur	·03	53·88
	Ash	·95	
			100·00

Coke (dry) per ton of Coal, 1205 lbs., or 10 cwts. 3 qrs. 1 lb

Analysis of the Coke (Dry).

Carbonaceous or combustible matter	98·18
Sulphur	·06
Ash	1·76
	100·00
Specific gravity of the coal	1·250
Weight of a cubic foot in pounds	77¾

Practical Results.

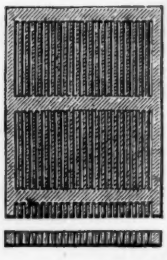
Gas per ton of coal at 60° F. and 30 in. bar.	10,122 cub. ft.
Illuminating power in standard sperm candles by Argand jet, consuming 5 cubic feet per hour	16·76 candles.
Value of one cubic foot of gas in grains of sperm	402
Equivalent of a ton of coal in pounds of sperm candles	581
Durability of one cubic foot of gas by 5-inch flame	42 min. 45 sec.
Gravity of the gas, air = 1000	448

Remarks.
The sample tested consisted of a complete section of the seam, 5 ft. 6 in. in thickness. The results show that this Coal is well adapted for the manufacture of gas and coke, both being for soft coal of very fine quality. Of the many hundreds of coal samples I have tested, I have not hitherto had one with so small a proportion of ash as the Cadzow Coal.
WILLIAM WALLACE.
Chemical and Gas Laboratory,
136, Bath Street, Glasgow, March 15, 1878.

JOHN HALL AND CO., STOURBRIDGE,
Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.
N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

BEST GAS COALS
DIRECT FROM THE
MARQUESS OF LONDONDERRY'S COLLIERIES,
COUNTY OF DURHAM.
For Prices and Particulars, apply to
MR. S. J. DITCHFIELD,
LONDONDERRY OFFICES, SEAHAM HARBOUR, COUNTY OF DURHAM.

R. DEMPSTER AND SONS'

WOOD SIEVES FOR PURIFIERS,
WITH TAPER OR PARALLEL BARS,
MADE BY SPECIAL MACHINERY.
SCRUBBERS FILLED WITH BOARDS,
On our approved principle, for the extraction of Ammonia.
Prices on application. References to First-Class Engineers.
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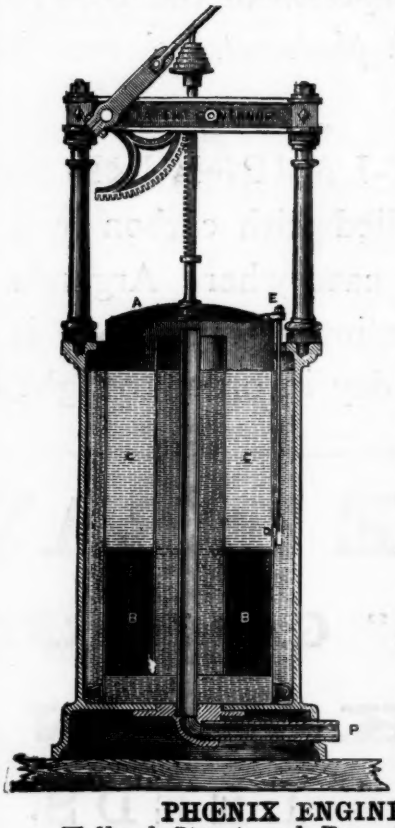
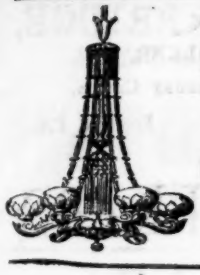
ELLAND, NEAR HALIFAX.
LONDON OFFICES: 2, SUFFOLK LANE, CANNON STREET, E.C.

GEORGE WALLER & CO.,
GAS AND HYDRAULIC ENGINEERS,
Patent Compensating Steam Governor,
WITH SELF-CONTAINED WATER-BALANCE.


DESCRIPTION OF THE APPARATUS
The illustration represents a section of the Patent Governor. The lower part of the Bell A is fitted with a loose Float B, and in the upper part of the Bell is a deep annular Water Chamber C, at the bottom of which is an opening D, with a slide outside regulated by a Screw Spindle E to allow the water to pass in and out of the Chamber C quickly or slowly, according to circumstances, but when once adjusted the slide does **not require altering.** This Self-compensating Chamber gives great steadiness to the up and down movement of the Bell and effectively prevents the "hunting" motion so common with other Governors, thereby ensuring a more perfect action on the throttle-valve of the Engine **than attained by any other.** The sketch shows the clip lever fixed to work on throttle-valve at an angle, and can work in either direction. P is the Gas Inlet-pipe to Governor.
G. W. & Co. also make **special Steam Throttle Valves,** suitable for working with this Governor, and alter existing Throttle Valves to same plan.
PHŒNIX ENGINEERING WORKS,
Holland Street and Bear Gardens, Southwark, S.E.



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BROAD STREET, BIRMINGHAM.

ESTABLISHED 1807.

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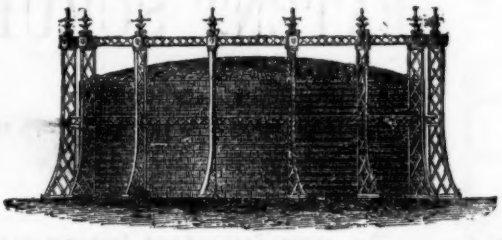
WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

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AND ALL REQUISITES FOR EITHER

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ALSO

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Hydraulic Engineers,

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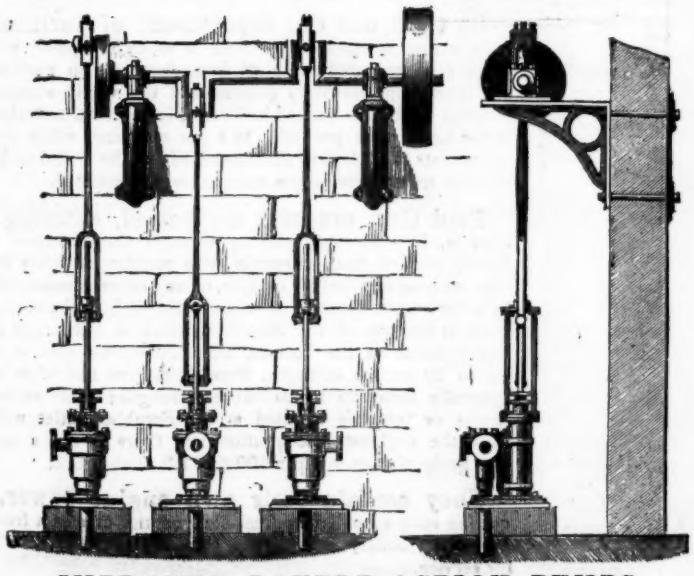
PUMPING MACHINERY of every Description.

SOLE LICENSEES AND MANUFACTURERS FOR GREAT BRITAIN OF

BLAKE'S PATENT DIRECT-ACTING STEAM-PUMPS.



IMPROVED DOUBLE-ACTION PUMPS.

For Water. For Tar. For Ammoniacal Liquor.

This Illustration shows an arrangement of three (No. 179) Improved Double-Action Pumps driven from the same crank-shaft, as frequently supplied for use in Gas and Chemical Works. The suction and discharge pipes can be arranged for drawing from and delivering in any required direction.

These Pumps have been supplied to nearly all the large Gas Companies and Chemical Works, both for Pumping Water, Tar, and Ammoniacal Liquor.

AS SYPHON PUMPS, IN COPPER OR SHEET IRON, ALWAYS IN STOCK.

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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

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AND

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Keep in London and at their works large stocks of PIPES and CONNEXIONS (1¼ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

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SILICA FIRE-BRICK CO.,

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Near SHEFFIELD,

Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

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Improved Wet and Dry Gas-Meters,

ALSO PATENTEES OF

COMPENSATING WET METERS;

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STATION AND TEST METERS TO ORDER

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Successors to

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ESTABLISHED 1836.

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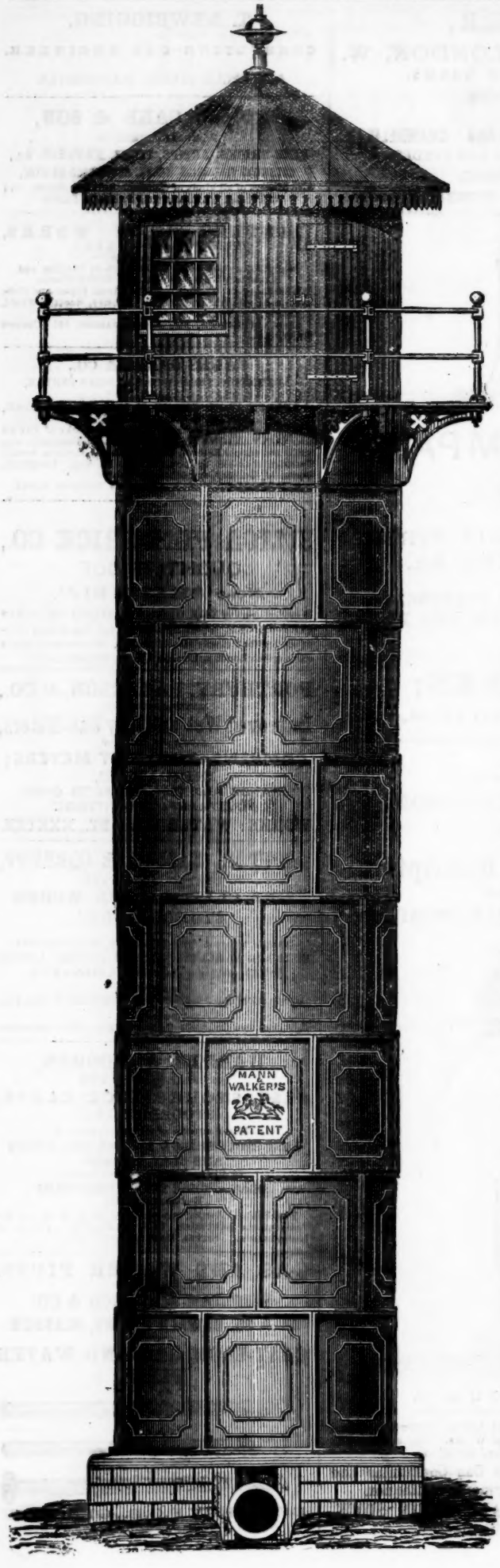
CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B., GLASGOW

Prices on application.



C. & W. WALKER,
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London, E.C.

MANN & WALKERS' PATENT SCRUBBER,

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the im- portant results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

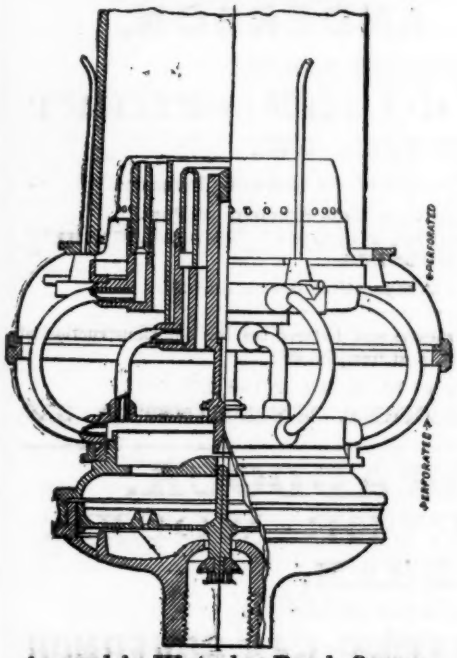
They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. and W. Walker, 8, Finsbury Circus, London, E.C., or to Mr. William Mann, late Superintendent of the Chartered Gas-Works, Blackfriars, London; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

WILLIAM SUGG'S
IMPROVED SYSTEM OF STREET LIGHTING,

SUITABLE FOR EITHER CANNEL OR COMMON GAS.

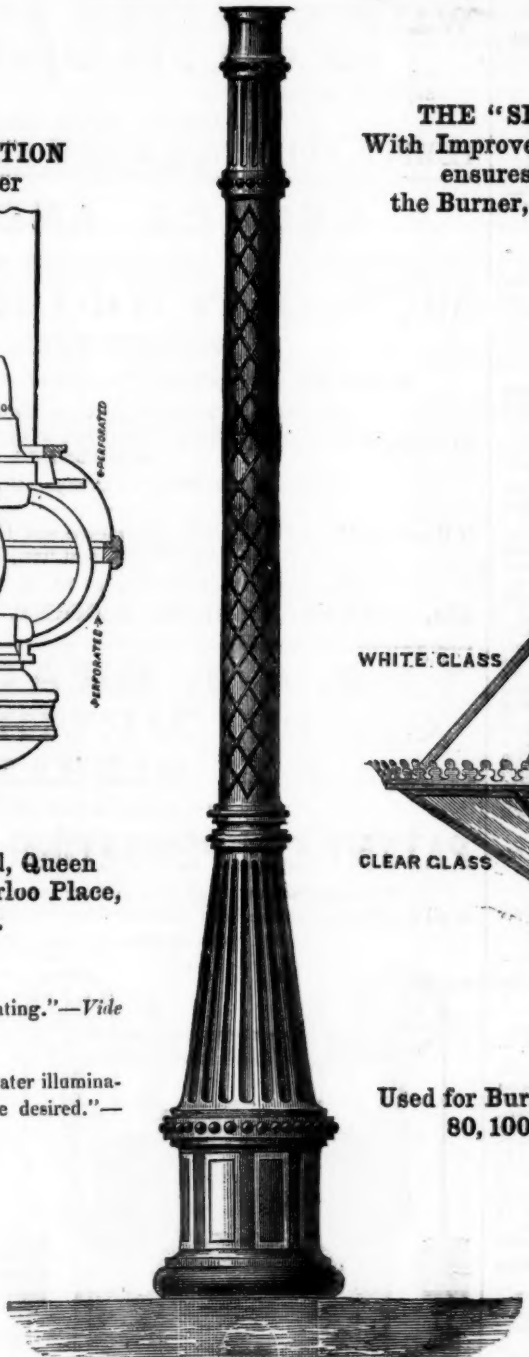
SECTIONAL ELEVATION
of 80-candle Burner



As used in Waterloo Road, Queen Victoria Street, City, Waterloo Place, and Regent Street.

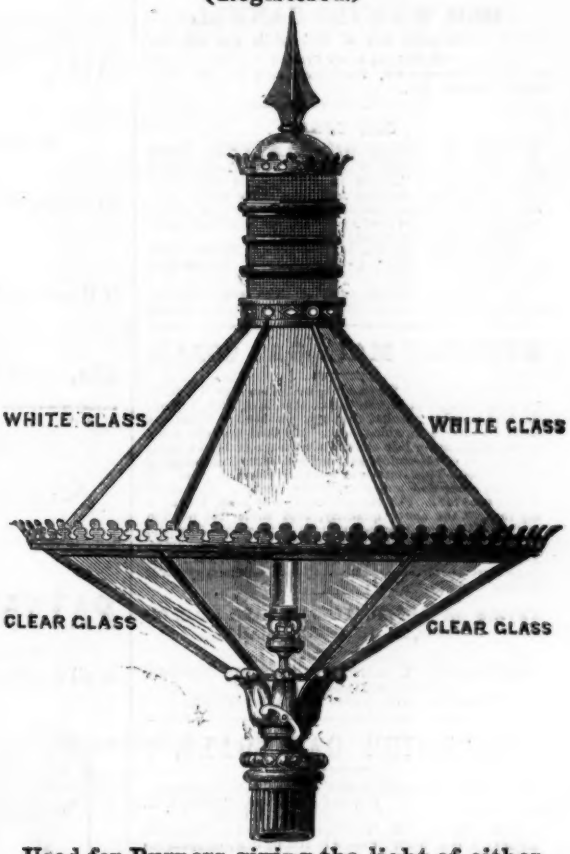
"The perfection of street gas lighting."—*Vide "Times," Feb.* 1, 1879.

"For all practical purposes no greater illumination than is hereby supplied could be desired."—*Vide "Daily News," Jan.* 13, 1879.



THE "WESTMINSTER" LAMP-COLUMN,
Of Improved construction,
8 feet and 9 feet from ground to top of Column.

THE "SHADOWLESS" LANTERN,
With Improved System of Ventilation, which ensures steadiness of the flame of the Burner, even in very windy weather.
(Registered.)



Used for Burners giving the light of either 80, 100, 150, or 200 Spermaceti Candles.

Other Patterns of Lanterns and Columns are in course of construction, and will be shortly Published in this JOURNAL.

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Yields 14,920 cubic feet of 40·92-candle gas per ton.

THRASHBUSH CANNEL

12,530 cubic feet of 40·22-candle gas per ton, and 9 cwts. of good coke.

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Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash. This cannel is almost free from sulphur.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

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POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17¼ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

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T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,594 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9666 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

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THE TYNE COAL COMPANY, LIMITED, OWNERS.
W. RICHARDSON, Fitter,
29, QUAYSIDE, NEWCASTLE-ON-TYNE.

HOLMSIDE GAS COALS.

South Metropolitan Gaslight and Coke Company,
589, Old Kent Road, London, S.E.,
Oct. 9, 1873.

At the request of Mr. Hedley, the owner of the Holmside Colliery, I have much pleasure in stating that, for about ten or twelve years past, this Company has taken at least half of its supply of Newcastle Coal from him. I can, therefore, confidently bear testimony to the good quality of the Holmside Coals, and consider they are equal to the best of the Newcastle Coals, in proof of which I may state that this year we are using those Coals exclusively, that the yield of Gas is from 9700 to 9800 feet per ton, and that the quality of the Gas, without any admixture of Cannel, is over 16 candles, as tested by the officer appointed by the Metropolitan Board of Works, using the London Gas Referees test.

The Coke is of excellent quality, and in quantity amounts to about 40 bushels from a ton of Coal.

The annual consumption of Coal amounts to about 75,000 tons.

GEORGE LIVESEY, Engineer and Secretary.

P.S.—I am at this date, Feb. 15, 1875, still using Holmside Coals as largely as ever, and am quite as well pleased with them as when I gave the above certificate.

GEORGE LIVESEY.

We are this year, 1878, using 80,000 tons of Holmside Coal. GEORGE LIVESEY.

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Address, 75, QUAYSIDE, NEWCASTLE-ON-TYNE.

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All negotiations respecting M. Brémond's patented process for preventing Deposits of

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AGENT FOR
THOMAS BARR'S LESMAHAGOW MAIN CANNEL,
AND
NEWTON, CHAMBERS, & CO.'S SILKSTONE GAS COALS.

Analyses and Quotations on application.

WILSON CARTER AND PEARSON,
GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station or for Export all kinds of Fuel for Gas purposes.

Address—CHIEF OFFICES:
TEMPLE BUILDINGS, 50, NEW STREET, BIRMINGHAM.

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GAS AND CONSULTING ENGINEER,

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WESTMINSTER, S.W.,

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RETORT SETTINGS—giving great Economy of Fuel.
STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES, WASHERS, SCRUBBERS.

FUEL-MACHINE, for Compressing Breeze and Tar.

N.B.—Pamphlet, with Eighteen Illustrations and Letterpress on the Construction of Gas-Works, post free, 2s. 6d.

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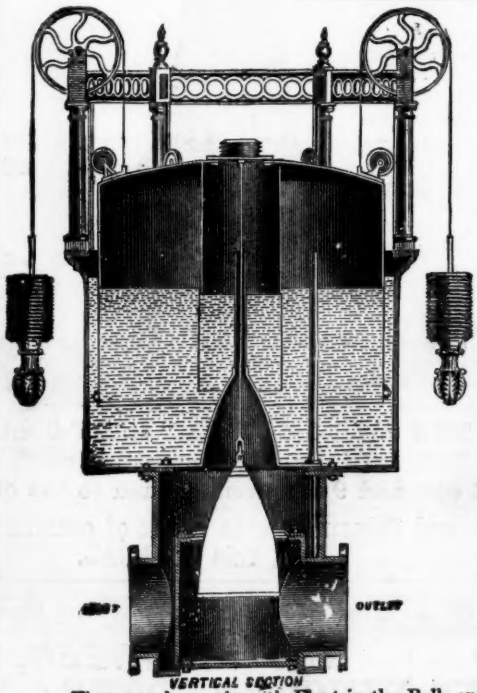
J. & J. BRADDOCK,
GLOBE METER-WORKS,
OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

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DODWORTH, BARNSLEY.

BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
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REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

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SILVER MEDAL
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RETORTS AND FIRE-BRICKS,
Being the Highest Honour given for this class.

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CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

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JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

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"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,—After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½**-Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly, "JAMES PATERSON."

Full particulars will be sent on application to us—address as above.

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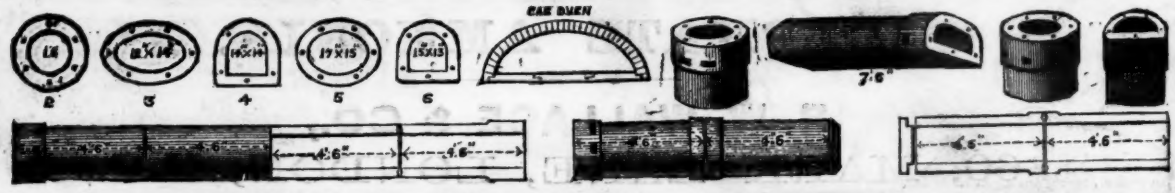

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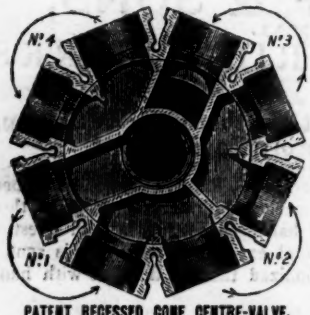

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Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

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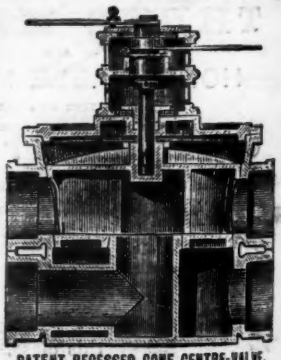
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By the use of which stoppages in service and other pipes are freed from naphthaline and other obstructions in a few minutes. PRICE 73s. net.

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